(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
25 April 2002 (25.04.2002)

PCT

(10) International Publication Number
WO 02/32943 A2

(51) International Patent Classification[7]: C07K 14/16

(21) International Application Number: PCT/US01/25721

(22) International Filing Date: 14 August 2001 (14.08.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/225,097	14 August 2000 (14.08.2000)	US
60/252,115	14 November 2000 (14.11.2000)	US
60/279,257	28 March 2001 (28.03.2001)	US

(71) Applicants *(for all designated States except US)*: **THE GOVERNMENT OF THE UNITED STATES OF AMERICA, as represented by THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES** [US/US]; National Institutes of Health, Office of Technology Transfer, 6011 Executive Blvd., Suite 325, Rockville, MD 20852-3804 (US). **CHADRABARTI, Bimal, K.** [IN/US]; 1147 McIntyre Drive, Ann Arbor, MI 48105 (US).

(72) Inventors; and

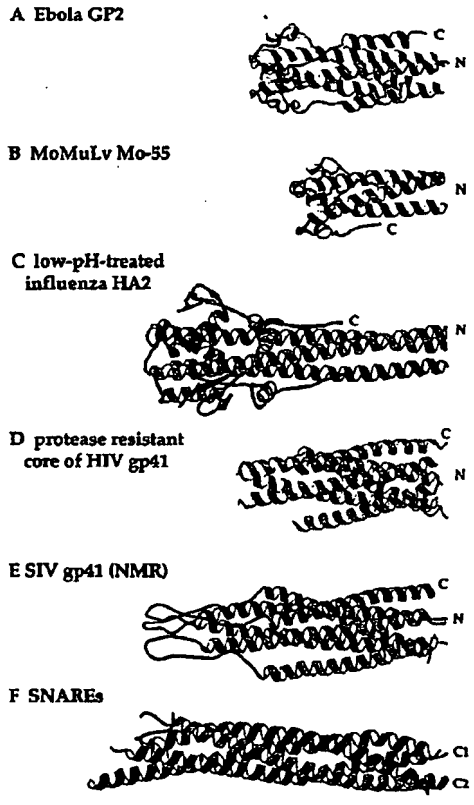
(75) Inventors/Applicants *(for US only)*: **NABEL, Gary, J.** [US/US]; 2520 30th Street, NW, Washington, DC 20008 (US). **HUANG, Yue** [CA/US]; 413 West Side Drive, #302, Gaithersburg, MD 20878 (US).

(74) Agent: **ALTMAN, Daniel, E.**; Knobbe, Martens, Olson and Bear, LLP, 16th Floor, 620 Newport Center Drive, Newport Beach, CA 92660 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AT (utility model), AU, AZ, BA, BB, BG, BR, BY, BZ, CA,

[Continued on next page]

(54) Title: MODIFICATIONS OF HIV ENV, GAG, AND POL ENHANCE IMMUNOGENICITY FOR GENETIC IMMUNIZATION



(57) Abstract: Modified HIV Env, Gag, Pol, or Nef DNA with improved ability to elicit antibody and CTL responses to HIV antigens have been identified as prototype immunogens for the treatment and prevention of HIV infections.

WO 02/32943 A2

CH, CN, CO, CR, CU, CZ, CZ (utility model), DE, DE (utility model), DK, DK (utility model), DM, DZ, EC, EE, EE (utility model), ES, FI, FI (utility model), GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SK (utility model), SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) **Designated States** *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Modifications of HIV Env, Gag, and Pol Enhance Immunogenicity for Genetic Immunization

Field of the Invention

The present invention relates to the field of molecular biology. The present invention discloses modified HIV Env, Gag, Pol, and Nef proteins, related nucleotide sequences, and usage for genetic immunization.

Background of the Invention

Protective immunity against human immunodeficiency virus-1 (HIV-1) is likely to require recognition of linear and conformation epitopes from multiple HIV antigens. Whether these responses can be elicited more effectively by virion-like structures or fused CTL epitopes is unknown.

The immune response to HIV infection in long-term non-progressors (Cao Y et al., 1995, N Engl J Med, **332**:201-8; Pantaleo G et al., 1995, N Engl J Med, **332**:209-16) and HIV-exposed sex workers suggests that specific viral immunity may limit infection and the symptoms of disease. No single characteristic yet correlates with protective immunity, but studies in non-human of primates suggest that both humoral and cellular immunity are required for this response. Depletion of cytotoxic T cells (CTLs) in chronically-infected macaques enhances viremia (Jin X et al.,1999, J Exp Med, **189**:991-8; Schmitz JE et al., 1999, Science, **283**:857-60). In humans, higher CTL responses correlate with lower viral load and stabilization of clinical symptoms (Musey L et al., 1997, N Engl J Med, **337**:1267-74; Ogg GS et al., 1998, Science, **279**:2103-6). In animal models, passive transfer of neutralizing antibodies can also contribute to protection against virus challenge (Burton DR, Montefiori DC, 1997, AIDS, **11 Suppl A**:S87-S98; Gauduin MC et al., 1997, Nat Med, **3**:1389-93; Moore JP, Ho DD., 1995, AIDS, **9 Suppl A**:S117-S136; Muster T et al., 1994, J Virol, **68**:4031-4; Muster T et al., 1993, J Virol, **67**:6642-7; Poignard P et al., 1996, Immunol Today, **17**:239-46; Sattentau QJ, 1996, Curr Opin Immunol, **8**:540-5; Shibata R et al., 1999, Nat Med, **5**:204-10). Neutralizing antibody responses can also be developed in HIV-infected individuals (Burton DR, Montefiori DC., 1997, AIDS, **11 Suppl A**:S87-S98; Poignard P et al., 1996, Immunol Today, **17**:239-46; Sattentau QJ., 1996, Curr Opin Immunol, **8**:540-5) and are associated with lower viral loads in long-term non-progressors (Montefiori DC et al., 1996, J Infect Dis, **173**:60-7). Though this neutralizing antibody response is

uncommon, it is directed largely against the Env protein of the virus (Robey WG et al., 1986, Proc Natl Acad Sci U S A, **83**:7023-7; Steimer KS et al., 1991, Science, **254**:105-8).

In early human vaccine trials, gp120 protein immunogens have yielded disappointing results: vaccine-induced antibodies have not been broadly neutralizing and have sometimes enhanced infection in vitro (Bolognesi DP, Matthews TJ, 1998, Nature, **391**:638-9; Connor RI et al., 1998, J Virol, **72**:1552-76; Haynes BF, 1996, Lancet, **348**:933-7; VanCott TC et al., 1995, J Immunol, **155**:4100-10). Monomeric gp120 loses oligomer-dependent epitopes and does not include sequences in the ectodomain of the gp41 that become exposed during virus entry (Broder CC et al., 1994, Proc Natl Acad Sci U S A, **91**:11699-703; Moore JP, 1995, Nature, **376**:115; Muster T et al., 1993, J Virol, **67**:6642-7). It is assumed that broadly neutralizing antibodies bind to native gp120/gp41 complex on the surface of the virus rather than soluble gp120 (Burton DR, Montefiori DC, 1997, AIDS, **11 Suppl A**:S87-S98).

The development of a cytotoxic T lymphocyte (CTL) response to viruses is often crucial to the outcome of infections. Lysis of infected cells prior to the production of progeny virions may limit virus burst size (Yang, O et al., 1996, J. Virol., **70**:5799-5806), and HIV specific $CD8^+$ cytotoxic T lymphocytes (CTL) have been shown to be important in viral clearance and in the control of initial HIV-1 spread (Borrow, P et al., 1994, J. Virol., **68**:6103-6110; Yang, O et al., 1996, J. Virol. **70**:5799-5806). CTL responses specific to HIV also contribute to reduction in viral load during acute and asymptomatic infection (Klein, MR, et al., 1995, J. Exp. Med. **181**:1365-1372; Moss, PAH et al., 1995, Proc. Natl. Acad. Sci. USA, **92**:5773-5777) and may be involved in protection against the establishment of persistent HIV infections (Rowland-Jones, SL et al., 1993, Lancet, **341**:860-861; Rowland-Jones, SL et.al., 1995, Nat. Med., **1**:59-64). High-frequency CTL responses to HIV-1 correlated with low viral load and slow disease progression in chronically infected individuals (Musey, L et al., 1997, N. Engl. J. Med., **337**:1267-1274; Ogg, GS et al., 1998, Science, **279**:2103-2106.). More compelling evidence of an antiviral effect of $CD8^+$ cells was demonstrated in controlled studies in macaques, in which $CD8^+$ cells were depleted *in vivo* using a monoclonal antibody. The viral loads in these animals increased or decreased as the $CD8^+$ cells were depleted or reappeared, respectively (Jin, X et al., 1999, J. Exp. Med., **189**:991-998; Schmitz, JE, et al., 1999, Science, **283**:857-860). Therefore, induction of a CTL response specific to these proteins represents a desirable response in an HIV-1 vaccine.

HIV-1 internal structural and enzymatic proteins contain conserved domains that preserve their functions and thus exhibit less antigenic diversity that may elicit more effective CTL responses (Nixon, DF et al., 1988, Nature, **336**:484-487.). Efficient and durable CTL responses require endogenous antigen synthesis and processing. Current vaccine delivery techniques include immunization with live, attenuated viruses, inactivated recombinant virus infection (Letvin, NL, 1998, Science, **280**:1875-1880) or plasmid DNA expression vectors. A major obstacle in the induction of CTL responses with naked DNA or recombinant virus during development of an HIV vaccine is that the expression of HIV-1 structural and enzymatic genes is tightly regulated by the virus itself. The expression of these proteins is heavily dependent upon the existence of the Rev-responsive element (RRE) of HIV-1 in recombinant vectors (Cullen, BR, 1992, Microbiol. Rev., **56**:375-394; Felber, BK et al., 1989, Proc Natl Acad Sci U S A, **86**:1495-1499). Poor expression is caused by the presence of AT rich inhibitory nucleotide sequences (INS) in the gag, pol and env genes, which inhibit the nuclear export and efficient expression of unspliced HIV1 mRNAs. Early studies of DNA vaccination against HIV in mice required the inclusion of Rev in their expression vectors (Lu, S et al., 1995, Virology, **209**:147-154; Okuda, K et al., 1995, AIDS Res. Hum. Retroviruses, **11**:933-943; Wang, B et al., 1993, Proc. Natl. Acad. Sci. U. S. A **90**:4156-4160), but modification of INS has been shown to facilitate Rev-independent expression of HIV-1 Gag (Qiu, J-T et al., 1999, J. Virol., **73**:9145-9152; zur Megede, J et al., 2000, J Virol 74:2628-2635), allowing detectable humoral and CTL responses against this protein (Qiu, J-T et al., 1999, J. Virol., **73**:9145-9152). These modified HIV-1 Gag genes produced viral-like particles of the expected density and morphology and induced an immune response to HIV-1 Gag after DNA immunization in mice (zur Megede, J et al., 2000, J Virol, **74**:2628-2635).

Summary of the Invention

Protective immunity against human immunodeficiency virus-1 (HIV-1) is likely to require recognition of linear and conformation epitopes from multiple HIV antigens, and whether these responses can be elicited more effectively by virion-like structures or fused CTL epitopes was previously unknown. Herein is provided a modified HIV Env with deletions in the cleavage site, fusogenic domain, and spacing of heptad repeats 1 and 2 to expose the core protein for optimal antigen

presentation and recognition. Additionally we provide a Gag-Pol or Gag-Pol-Nef fusion protein that is a polyprotein designed to maximize epitope presentation. The invention extends the mutation in HIV Env, Gag, Pol, and Nef to any HIV clade or strain and to related proteins of other viruses. Different combinations, different orders, and different variations on a theme are envisioned, the theme being to optimize presentation of epitopes that generate broad CTL and antibody responses.

More particularly, we have investigated the effect of specific mutations in human immunodeficiency virus type 1 (HIV-1) envelope (Env) on humoral and cellular immune responses after DNA vaccination. Mice were injected with plasmid expression vectors encoding HIV Env with modifications of conserved glycosylation sites or different COOH-terminal mutations intended to mimic a fusion intermediate. Elimination of conserved glycosylation sites did not substantially enhance humoral or CTL immunity. In contrast, a modified gp140 with deletions in the cleavage site, fusogenic domain and spacing of heptad repeats 1 and 2 enhanced humoral immunity without reducing the efficacy of the CTL response. Because of its ability to stimulate the antibody response to native gp160 without affecting cellular immunity, this modified gp140 or a related derivative is envisioned to be a useful component of an AIDS vaccine.

In addition, we have examined the immune response to HIV-1 Gag and Pol after plasmid DNA immunization with Rev-independent expression vectors encoding various forms of these proteins. Immune responses were analyzed after vaccination with four expression vectors, including Gag alone or Gag-Pol, both of which gave rise to virion-like particles (VLPs), compared to Pol alone or a Gag-Pol fusion protein that did not form VLPs. The Gag-Pol fusion protein induced the most broad and potent CTL responses to Gag and Pol in DNA-vaccinated mice, and this immunogen also readily elicited an antibody response to HIV-1 Gag and Pol determinants. Through its ability to induce broad CTL and antibody responses, this Gag-Pol fusion protein or a related derivative is envisioned to be a useful component of an AIDS vaccine.

Brief Description of the Drawings

Figure A. Comparison of GP2 with the structures of viral and cellular membrane fusion proteins.

(A) Recombinant Ebola Zaire GP2, (B) Recombinant Mo-55 from the TM subunit of MoMuLv, (C) Low pH-treated HA2 from influenza virus, (D) Recombinant, proteolysis-resistant core of HIV-1 gp41, (E) Recombinant SIV gp41, NMR structure, (F) Recombinant core coiled segments of the SNARES syntaxin 1-A, synaptobrevin-II, and SNAP-25B. Weissenhorn et al., 1998, Molecular Cell, 2, 605-616.

Figure I. Schematic representation of functional domains and mutations in HIV-1 Env glycoproteins.

Full-length envelope polyprotein, gp160, with the indicated features based on the amino acid residues of HXB2 is shown (top). Functional domains include the gp120/gp41 cleavage site (residues 510/511), the fusion domain (512-527), the two heptad repeats (546-579 and 628-655), the transmembrane domain (684-705), and the cytoplasmic domain (706-856). The mutant forms of the envelope proteins are shown below the structure of gp160. COOH deletions were introduced that terminate the envelope protein at positions 752, 704, or 680 to produce gp150, gp145, or gp140, respectively. Two internal deletions that removed the cleavage site, the fusion domain, and the region between the two heptad repeats were introduced into gp160, gp150, gp145, and gp140. A further deletion in the COOH-terminal region at position 592 removed the second heptad repeat, the transmembrane domain, and the interspace region to produce gp128ΔCFI. To disrupt potential glycosylation sites, asparagine (N) residues at eleven positions (88, 156, 160, 197, 230, 234, 241, 262, 276, 289, and 295) were replaced with aspartic acid (D) residues in both gp160 and gp150. Versions of both gp160 and gp150 were created with a total of 17 mutated glycosylation sites by including six additional N to D substitutions at positions 332, 339, 356, 386, 392, and 448.

Figure II. Comparison of the expression of the HIV-1 gp160 with codon-optimized gp160.

A. Expression of plasmids encoding Rev-dependent and Rev-independent codon-modified gp160. Upper panel: expression of Rev-dependent viral gp160 (left) and codon-modified gp160 (right) in transfected 293 cells. Lower panel: comparable expression of β-actin in these transfected cells.

B-D. Expression of mutant CXCR4- and CCR5-tropic HIV Env glycoproteins with COOH-terminal truncations (panels A and B, respectively). CXCR4-tropic envelope proteins containing mutant glycosylation sites and mutant functional domains are shown (panels C and D, respectively). The indicated proteins were detected by immunoblotting as above. Cell lysates produced by transfection with vector containing no insert were used as controls (first lane in each panel).

Figure III. Cytotoxicity of full-length gp160 is eliminated by deletion of the COOH-terminal cytoplasmic domain.

Cell rounding and detachment was not observed in control-transfected 293 cells (A), in contrast to full-length gp160 (B) and to a lesser extent in cells transfected with gp150 (C), in contrast to gp145 (D) or gp140 (E).

Figure IV. Expression of soluble gp140ΔCFI HIV-1 envelope variant.

Immunoprecipitation and Western blot analysis of supernatants from the indicated transfected cells.

Figure V. Antibody response against HIV-1 envelope proteins in DNA immunized mice.

A. Comparison of the antibody response in mice immunized with gp140 (ΔCFI) or other Env plasmid expression vectors. Sera were collected 2 weeks after the last immunization and used to immunoprecipitate codon-altered gp160 from lysates of transfected 293 cells. The quantitation of the immunoprecipitated gp160 was done as described in Figure 5B. The average of the normalized data has been presented as a bar diagram.

B. Antibody responses in mice immunized with different mutant Env expression vectors. Antisera from immunized mice were diluted in IP buffer and 1

μl of each diluted serum was used to immunoprecipitate codon-altered HIV-1 gp160 from lysates of transfected 293 cells as described in Figure 3A. The gels were scanned and the intensity of the gp160 band was determined by densitometry using the program Image Quant and presented relative to the intensity of gp160 immunoprecipitated with positive control sera (rabbit anti-gp160), which was used to normalize data between experiments. These data are presented graphically to facilitate comparison among groups.

C. Antibody responses in mice immunized with gp140 or gp140 (ΔCFI) were determined by immunoprecipitation and Western blotting. Animals received two booster doses (100 μg) of the same plasmid, two weeks apart. Sera (1 μl) collected 2 weeks after the last immunization was used to immunoprecipitate codon-optimized HIV-1 gp160 from lysates of transfected 293 cells containing 400 μg of total protein. Each lane corresponds to the sera from an animal immunized with either the control vector (lanes 1 and 2), CXCR4-tropic gp140 (lanes 3-6), or plasmid that expresses gp140 with the indicated mutant functional domains (lanes 7-10). A mouse monoclonal antibody to gp160 (HIV-1 V3 Monoclonal (IIIB-V3-13), NIH AIDS Reagent Program) was used as a positive control (lane 11).

Figure VI. CTL response against HIV-1 envelope proteins in DNA immunized mice.

The CTL response to CXCR4-tropic Env and indicated deletion mutants is shown (A). The CTL responses to CXCR4-tropic envelope with glycosylation site and ΔCFI mutations are shown (B and C, respectively). Dependence of CTL activity on CD8 cells was shown by magnetic bead depletion using the indicated representative immunogens (D). Spleen cells were isolated from immunized mice two weeks after the final immunization and stimulated *in vitro* with irradiated cells expressing gp160 with addition of hIL2 (5 U/ml) at day 4. The cytolytic activity of the restimulated spleen cells was tested after 7 days against V3 peptide-pulsed BC10ME cells. Similar findings were observed with target cells that stably express full-length Env.

Figure VII. Schematic representation of HIV-1 Gag-Pol expression constructs.

The protein sequences of Gag (amino acids 1-432) from HXB2 (GenBank accession number K03455) and Pol (amino acids 3-1003) from NL4-3 (GenBank

accession number M19921) were used to create a synthetic version of hGag-Pol using codons found in human cells. hGag-PolΔFSΔPr was made by modification of the frame shift site (FS) and inactivation of protease. For hPol, 432 amino acids were deleted from the NH_2-terminal region of hGag-Pol and addition of an ATG codon. hGag was made by deletion of 925 amino acids from the COOH-terminal region of hGag-Pol. hGag-Pol, hGag-PolΔFSΔPr, hPol and hGag are expressed from the pNGVL-3 vector backbone.

Figure VIII. HIV-1 Gag-Pol expression in transfected 293T cells and stably transfected CT26 and BC10 ME cells.

Cell lysates from 293T cells transfected with pCMV ΔR8.2 containing viral Gag-Pol (vGag-Pol) (Naldini, L et al., 1996, Science, 272:263-267), pNGVL-hGag, hPol, hGag-PolΔFSΔPr and hGag-Pol were separated by 4-15% gradient SDS-PAGE, transferred to nitrocellulose filters, and analyzed by immunoblotting with (A) human anti HIV-1-IgG, (B) monoclonal anti-p24, and (C) rabbit anti-RT. (D) Cell lysates from CT26 and BC10ME cells stably transduced with either hGag or hPol were analyzed with human anti HIV-1-IgG.

Figure IX. Transmission electron microscopy of HIV-1 immature virus-like particles (VLP) produced by transfected 293T.

Cells were transfected with pNGVL-hGag 48 hours prior to harvesting and fixing (magnification 25,000X).

Figure X. Gag or Pol specific CTL response mediated by CD8 positive cells in immunized mice.

Two weeks after mice were immunized with a control vector, hGag, hPol, hGag-PolΔFSΔPr, and hGag-Pol, splenic cells were harvested and sensitized with naïve mouse splenic cells pulsed with Gag or Pol peptides. One week later, effector cells were tested for cytolytic activity in a 5-h ^{51}Cr release assay using ^{51}Cr-labeled BC10ME target cells that were pulsed for 2 hours with either (A) HIV-1 Gag peptides, or (B) HIV-1 Pol peptides. (C) CD4+ or CD8+ lymphocytes were depleted from splenic cells of immunized mice with anti-mouse- CD4+ or CD8+ Dynal beads according to the manufacturer's instructions.

Figure XI. Gag or Pol specific CTL response mediated by CD8 positive cells in immunized mice using stable expressing cell lines as target cells.

Two weeks after immunization in mice, splenic cells were harvested and sensitized with naïve mouse splenic cells pulsed with Gag or Pol peptides. One week later, effector cells were tested for cytolytic activity in a 5-h ^{51}Cr release assay using ^{51}Cr-labeled BC10ME target cells expressing either (A) HIV-1 Gag or (B) Pol protein.

Figure XII. HIV-1 p24 antibody ELISA assays, HIV-1 immunoblotting and immunoprecipitation Western blotting.

(A) An HIV-1 p24 antibody ELISA assay was performed by coating 96-well plates with 50 µl of purified recombinant HIV-1_{IIIB} p24 antigen at a concentration of 2 µg/ml in PBS buffer, pH 7.4.

(B) HIV-1 immunoblotting of strips containing HIV-1 proteins were incubated with pooled mouse sera at a dilution of 1:25. Bands were visualized using the ECL western blotting detection reagent.

(C) Immunoprecipitation and Western blotting of hPol gene-transfected 293T cell lysates three days after transfection with RIPA buffer. The pooled mouse serum was diluted with IP buffer. After adding 10 µg of the cell lysate containing HIV-1 Pol protein, the reactions were incubated overnight on a rotator at 4°C. The next day, 250 µl of Protein G and A Sepharose beads (10%V/V in IP buffer) were added, and the reactions were incubated on a rotator for 2 hours at 4°C. The reactions were washed 4x with IP buffer, re-suspended with 30 µl of 1X sample buffer, and then loaded onto SDS-PAGE. The reactions were transferred to an Immobilon P membrane, and then incubated with anti HIV-1-IgG. Bands were visualized using the ECL Western blotting detection reagent.

Table 1

Env Plasmids				
Plasmid	Plasmid Name/Description	Plasmid Map Name	SEQ ID NO	Figure
2100	pVR1012x/s R5gp139-Nef (delta) MHC (delta) CD4/h	pVR1012x/s R5gp139-Nef delta MHC delta CD4/h	1	1
2200	pVR1012x/s R5gp157-Nef (delta) MHC (delta) CD4/h	pVR1012x/s R5gp157-Nef deltaMHC deltaCD4/h	2	2
2300	pVR1012x/s X4 gp139-Nef deltaMHC deltaCD4/h	pVR1012x/s X4gp139-Nef delta MHC delta CD4/h	3	3
2302	pVR1012x/s X4gp130-Nef/h	pVR1012x/s X4gp130-Nef/h	4	4
2400	pVR1012x/s X4gp157-NefDMHCDCD4/h	pVR1012x/sX4gp157-Nef delta MHC delta CD4/h	5	5
2700	pVR1012x/s X4gp140 /h	pVR1012x/s X4gp140/h	6	6
2701	pVR1012x/s X4gp140 ΔCFI /h **OR** pVR1012x/s X4gp140(del F/CL del H IS)/h	pVR1012x/s X4gp140(del F/CL del H IS)/h	7	7
2702	pVR1012x/s X4gp128 ΔCFI /h **OR** pVR1012x/s X4gp128(del F/CL)/h	pVR1012x/s X4gp128(del F/CL)/h	8	8
2706	pVR1012x/s X4gp145 /h	pVR1012x/s X4gp145/h	9	9
2707	pVR1012x/s X4gp145 ΔCFI /h **OR** pVR1012x/s X4gp145(del F/CL del H IS)/h	pVR1012x/s X4gp145(del F/CL del H IS)/h	10	10
2800	pVR1012x/s R5gp140 /h	pVR1012x/s R5gp140/h	11	11
2801	pVR1012x/s R5gp140 ΔCFI /h **OR** pVR1012x/sR5gp140(del F/CL del H IS)/h	pVR1012x/sR5gp140(del F/CL del H IS)/h	12	12
2804	pVR1012x/s R5gp145 /h	pVR1012x/s R5gp145/h	13	13
2805	pVR1012x/s R5gp145 ΔCFI /h **OR** pVR1012x/s R5gp145(del F/CL del H IS)/h	pVR1012x/sR5gp145(del F/CL del H IS)/h	14	14
2810	pVR1012x/s R5gp140delC1(delCFI)/h	pVR1012x/sR5gp140delC1(delCFI)/h	15	15
2811	pVR1012x/s R5gp140delC2(delCFI)/h	pVR1012x/sR5gp140delC2(delCFI)/h	16	16
2812	pVR1012x/s R5gp140delC3(delCFI)/h	pVR1012x/sR5gp140delC3(delCFI)/h	17	17
2813	pVR1012x/s R5gp140delC4 (delCFI)/h	pVR1012x/sR5gp140delC4(delCFI)/h	18	18
2814	pVR1012x/s R5gp140delC5 (delCFI)/h	pVR1012x/sR5gp140delC5(delCFI)/h	19	19
2820	pVR1012x/s R5gp140(dCFI)/dV1	pVR1012x/s R5gp140(dCFI)dV1/h	20	20
2821	pVR1012x/s R5gp140(dCFI)/dV2	pVR1012x/s gp140(dCFI)dV2/h	21	21
2822	pVR1012x/s R5gp140(dCFI)/dV3	pVR1012x/s gp140(dCFI)dV3/h	22	22
2823	pVR1012x/s R5gp140(dCFI)/dV4	pVR1012x/s R5gp140(dCFI)dV4/h	23	23
2824	pVR1012x/s R5gp140(dCFI)/dV12	pVR1012x/s R5gp140(dCFI)dV12/h	24	24
2825	pVR1012x/s R5gp140(dCFI)/dV13	pVR1012x/s R5gp140(dCFI)dV13/h	25	25
2826	pVR1012x/s R5gp140(dCFI)/dV14	pVR1012x/s R5gp140(dCFI)dV14/h	26	26
2827	pVR1012x/s R5gp140(dCFI)/dv23	pVR1012x/s R5gp140(dCFI)dv23/h	27	27
2828	pVR1012x/s R5gp140(dCFI)/dv24	pVR1012x/s R5gp140(dCFI)dv24/h	28	28
2829	pVR1012x/s R5gp140(dCFI)/dv34	pVR1012x/s R5gp140(dCFI)dv34/h	29	29
2830	pVR1012x/s R5gp140(dCFI)/dv123	pVR1012x/s R5gp140(dCFI)dv123/h	30	30

Env Plasmids				
Plasmid	Plasmid Name/Description	Plasmid Map Name	SEQ ID NO	Figure
2831	pVR1012x/s R5gp140(dCFI)/dv124	pVR1012x/s R5gp140(dCFI)dv124/h	31	31
2832	pVR1012x/s R5gp140(dCFI)/dv134	pVR1012x/s R5gp140(dCFI)dv134/h	32	32
2833	pVR1012x/s R5gp140(dCFI)/dv234	pVR1012x/s R5gp140(dCFI)dv234/h	33	33
2834	pVR1012x/s R5gp140(dCFI)/dV1234	pVR1012x/s R5gp140(dCFI)dv1234/h	34	34
2835	pAdApt R5gp140(dCFI)/dV1	pAdApt CMV TbGH (+) R5gp140(dCFI)dv1/h	35	35
2836	pAdApt R5gp140(dCFI)/dV2	pAdApt CMV TbGH (+) R5gp140(dCFI)dv2/h	36	36
2837	pAdApt R5gp140(dCFI)/dV3	pAdApt CMV TbGH (+) R5gp140(dCFI)dv3/h	37	37
2838	pAdApt R5gp140(dCFI)/dV4	pAdApt CMV TbGH (+) R5gp140(dCFI)dv4/h	38	38
2839	pAdApt R5gp140(dCFI)/dV12	pAdApt CMV TbGH (+) R5gp140(dCFI)dv12/h	39	39
2840	pAdApt R5gp140(dCFI)/dV13	pAdApt CMV TbGH (+) R5gp140(dCFI)dv13/h	40	40
2841	pAdApt R5gp140(dCFI)/dV14	pAdApt CMV TbGH (+) R5gp140(dCFI)dv14/h	41	41
2842	pAdApt R5gp140(dCFI)/dV23	pAdApt CMV TbGH (+) R5gp140(dCFI)dv23/h	42	42
2843	pAdApt R5gp140(dCFI)/dV24	pAdApt CMV TbGH (+) R5gp140(dCFI)dv24/h	43	43
2844	pAdApt R5gp140(dCFI)/dV34	pAdApt CMV TbGH (+) R5gp140(dCFI)dv34/h	44	44
2845	pAdApt R5gp140(dCFI)/dV123	pAdApt CMV TbGH (+) R5gp140(dCFI)dv123/h	45	45
2846	pAdApt R5gp140(dCFI)/dV124	pAdApt CMV TbGH (+) R5gp140(dCFI)dv124/h	46	46
2847	pAdApt R5gp140(dCFI)/dV134	pAdApt CMV TbGH (+) R5gp140(dCFI)dv134/h	47	47
2848	pAdApt R5gp140(dCFI)/dV234	pAdApt CMV TbGH (+) R5gp140(dCFI)dv234/h	48	48
2849	pAdApt R5gp140(dCFI)/dV1234	pAdApt CMV TbGH (+) R5gp140(dCFI)dv1234/h	49	49
2850	pVR1012x/s R5gp145delC1 (delCFI)/h	pVR1012x/sR5gp145delC1(delCFI)/h	50	50
2851	pVR1012x/s R5gp145delC2 (delCFI)/h	pVR1012x/sR5gp145delC2(delCFI)/h	51	51
2852	pVR1012x/s R5gp145delC3 (delCFI)/h	pVR1012x/sR5gp145delC3(delCFI)/h	52	52
2853	pVR1012x/s R5gp145delC4 (delCFI)/h	pVR1012x/sR5gp145delC4(delCFI)/h	53	53
2854	pVR1012x/s R5gp145delC5 (delCFI)/h	pVR1012x/sR5gp145delC5(delCFI)/h	54	54
2860	pVR1012x/s R5gp145(dCFI)/h/dV1	pVR1012x/s R5 gp145(dCFI)dv1/h	55	55
2861	pVR1012x/s R5gp145(dCFI)/h/dV2	pVR1012x/s R5gp145(dCFI)dv2/h	56	56
2862	pVR1012x/s R5gp145(dCFI)/h/dV3	pVR1012x/s R5gp145(dCFI)dv3/h	57	57
2863	pVR1012x/s R5gp145(dCFI)/h/dV4	pVR1012x/s R5gp145(dCFI)dv4/h	58	58
2864	pVR1012x/s R5gp145(dCFI)/h/dV12	pVR1012x/s R5gp145(dCFI)dv12/h	59	59
2865	pVR1012x/s R5gp145(dCFI)/h/dV13	pVR1012x/s R5gp145(dCFI)dv13/h	60	60
2866	pVR1012x/s R5gp145(dCFI)/h/dV14	pVR1012x/s R5gp145(dCFI)dv14/h	61	61
2867	pVR1012x/s R5gp145(dCFI)/h/dV23	pVR1012x/s R5gp145(dCFI)dv23/h	62	62

Env Plasmids				
Plasmid	Plasmid Name/Description	Plasmid Map Name	SEQ ID NO	Figure
2868	pVR1012x/s R5gp145(dCFI)/h/dV24	pVR1012x/s R5gp145(dCFI)dv24/h	63	63
2869	pVR1012x/s R5gp145(dCFI)/h/dV34	pVR1012x/s R5gp145(dCFI)dv34/h	64	64
2870	pVR1012x/s R5gp145(dCFI)/h/dV134	pVR1012x/s R5gp145(dCFI)dv134/h	65	65
2871	pVR1012x/s R5gp145(dCFI)/h/dV234	pVR1012x/s R5gp145(dCFI)dv234/h	66	66
2872	pVR1012x/s R5gp145(dCFI)dv123/h	pVR1012x/s R5gp145(dCFI)dv123/h	67	67
2873	pVR1012x/s R5gp145(dCFI)/h/dV124	pVR1012x/s R5gp145(dCFI)dv124/h	68	68
2874	pVR1012x/s R5gp145(dCFI)/h/dV1234	pVR1012x/s R5gp145(dCFI)dv1234/h	69	69
2900	pVR1012x/s R5gp150 /h	pVR1012x/s R5gp150/h	70	70
3000	pVR1012x/s R5gp160 /h	pVR1012x/sR5gp160/h	71	71
3200	pVR1012x/s X4gp150 /h	pVR1012x/s X4gp150/h	72	72
3201	pVR1012x/s X4gp150 ΔCFI /h **OR** pVR1012x/s X4gp150(del F/CL del H IS)/ h	pVR1012x/s X4gp150(del F/CL del H IS)/ h	73	73
3202	pVR1012x/s X4gp150 Δgly /h	pVR1012x/s X4gp150 delta gly	74	74
3203	pVR1012x/s X4gp150 AB Δgly /h	pVR1012x/s X4gp150 AB (delta)gly/h	75	75
3300	pVR1012x/s X4gp160 /h	pVR1012x/s X4gp160/h	76	76
3301	pVR1012x/s X4gp160 ΔCFI /h **OR** pVR1012x/s X4gp160(del F/CL del H IS)/h	pVR1012x/s X4gp160(del F/CL del H IS)/h	77	77
3400	pVR1012x/s X4gp160 Δgly /h	pVR1012x/s X4gp160 delta gly	78	78
3401	pVR1012x/s X4gp160 AB Δgly /h **OR** pVR1012x/s X4gp160AB mut Δgly /h	pVR1012x/s X4gp160 AB Dgly/h	79	79
3500	pVR1012x/s Nef/h	pVR1012x/s Ncf/h	80	80
3600	pVR1012x/s NefDMHCDCD4/h	pVR1012x/s Nef delta MHC delta CD4/h	81	81
3700	pVR1012x/s NefDCD4/h	pVR1012x/s Nef delta CD4/h	82	82
3800	pVR1012x/s NefDMHC/h	pVR1012x/s Nef delta MHC/h	83	83
5200	pVR1012 x/s 89.6Pgp128(del F/CL)/h	pVR1012 x/s 89.6Pgp128(del F/CL)/h	84	84
5201	R5 Clade 89.6P gp140 ΔCFI /h	pVR1012x/s 89.6Pgp140(del F/CL del H IS)/h	85	85
5202	pVR1012 x/s 89.6Pgp145(del F/CL del H IS)/h	pVR1012 x/s 89.6Pgp145(del F/CL del H IS)/h	86	86
5203	pVR1012 x/s 89.6Pgp160/h	pVR1012 x/s 89.6Pgp160/h	87	87
5300	R5 Clade C gp140 ΔCFI /h **OR** pVR1012x/s R5 (cladeC)gp140(del F/CL del H IS)/h	pVR1012x/s CladeC(R5)gp140(del F/CL del H IS)/h	88	88
5301	pVR1012x/s R5(cladeC)gp145(del F/CL del H IS)/h	pVR1012x/s CladeC(R5)gp145(del F/CL del H IS)/h	89	89
5303	pVR1012x/s R5gp145 CladeC (Brazil) delCFI/h	pVR1012x/s R5gp145 CladeC (Brazil) delCFI/h	90	90
5304	pVR1012x/s R5(clade A)gp140(del F/CL del H IS)/h	pVR1012x/s R5gp140CladeA (dCFI)/h	91	91
5305	pVR1012x/s R5(clade A)gp145(del F/CL del H IS)/h	pVR1012x/s R5gp145CladeA (dCFI)/h	92	92
5306	pVR1012x/s R5(clade E)gp140(del F/CL del H IS)/h	pVR1012x/s R5gp140 Cladc E (dCFI)/h	93	93
5307	pVR1012x/s R5(clade E)gp145(del F/CL del H IS)/h	pVR1012x/s R5 gp145 Clade E (dCFI)/h	94	94

Env Plasmids				
Plasmid	Plasmid Name/Description	Plasmid Map Name	SEQ ID NO	Figure
5308	pVR1012x/s R5(clade C South African)gp140(del F/CL del H IS)/h	pVR1012x/s R5gp140 Clade C(SA) (dCFI)/h	95	95
5309	pVR1012x/s R5(clade C South African)gp145(del F/CL del H IS)/h	pVR1012x/s R5gp145 CladeC(SA) (dCFI)/h	96	96
5350	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV1	pVR1012x/s R5gp140CladeC (Brazil) dCFIdv1/h	97	97
5351	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV12	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv12/h	98	98
5352	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV123	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv123/h	99	99
5353	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV1234	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv1234/h	100	100
5354	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV124	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv124/h	101	101
5355	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV13	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv13/h	102	102
5356	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV134	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv134/h	103	103
5357	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV14	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv14/h	104	104
5358	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV2	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv2/h	105	105
5359	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV23	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv23/h	106	106
5360	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV234	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv234/h	107	107
5361	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV24	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv24/h	108	108
5362	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV3	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv3/h	109	109
5363	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV34	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv34/h	110	110
5364	pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV4	pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv4/h	111	111
5365	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV1	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv1/h	112	112
5366	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV12	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv12/h	113	113
5367	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV123	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv123/h	114	114
5368	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV1234	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv1234/h	115	115
5369	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV124	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv124/h	116	116
5370	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV13	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv13/h	117	117
5371	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV134	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv134/h	118	118
5372	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV14	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv14/h	119	119
5373	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV2	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv2/h	120	120
5374	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV23	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv23/h	121	121
5375	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV234	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv234/h	122	122
5376	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV24	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv24/h	123	123
5377	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV3	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv3/h	124	124
5378	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV34	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv34/h	125	125
5379	PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV4	pVR1012x/s R5gp145CladeC (Brazil) (dCFI)dv4/h	126	126

Env Plasmids				
Plasmid	Plasmid Name/Description	Plasmid Map Name	SEQ ID NO	Figure
5500	pVR1012x/s R5(SA-C)gp140(dCFI) dV1/h	pVR1012x/s R5 gp140(dCFI) SA dv1/h	127	127
5501	pVR1012x/s R5(SA-C)gp140(dCFI) dV12/h	pVR1012x/s R5 gp140(dCFI) SA dv12/h	128	128
5502	pVR1012x/s R5(SA-C)gp140(dCFI) dV123/h	pVR1012x/s R5 gp140(dCFI) SA dv123/h	129	129
5503	pVR1012x/s R5(SA-C)gp140(dCFI)dV1234/h	pVR1012x/s R5 gp140(dCFI) SA dv1234/h	130	130
5504	pVR1012x/s R5(SA-C)gp140(dCFI)dV124/h	pVR1012x/s R5 gp140(dCFI) SA dv124/h	131	131
5505	pVR1012x/s R5(SA-C)gp140(dCFI)dV13/h	pVR1012x/s R5 gp140(dCFI) SA dv13/h	132	132
5506	pVR1012x/s R5(SA-C)gp140(dCFI)dV134/h	pVR1012x/s R5 gp140(dCFI) SA dv134/h	133	133
5507	pVR1012x/s R5(SA-C)gp140(dCFI)dV14/h	pVR1012x/s R5 gp140(dCFI) SA dv14/h	134	134
5508	pVR1012x/s R5(SA-C)gp140(dCFI)dV2/h	pVR1012x/s R5 gp140(dCFI) SA dv2/h	135	135
5509	pVR1012x/s R5(SA-C)gp140(dCFI)dV23/h	pVR1012x/s R5 gp140(dCFI) SA dv23/h	136	136
5510	pVR1012x/s R5(SA-C)gp140(dCFI)dV234/h	pVR1012x/s R5 gp140(dCFI) SA dv234/h	137	137
5511	pVR1012x/s R5(SA-C)gp140(dCFI)dV24/h	pVR1012x/s R5 gp140(dCFI) SA dv24/h	138	138
5512	pVR1012x/s R5(SA-C)gp140(dCFI)dV3/h	pVR1012x/s R5 gp140(dCFI) SA dv3/h	139	139
5513	pVR1012x/s R5(SA-C)gp140(dCFI)dV34/h	pVR1012x/s R5 gp140(dCFI) SA dv34/h	140	140
5514	pVR1012x/s R5(SA-C)gp140(dCFI)dV4/h	pVR1012x/s R5 gp140(dCFI) SA dv4/h	141	141
5515	pVR1012x/s R5(SA-C)gp145(dCFI)dV1/h	pVR1012x/s R5 gp145(dCFI) SA dv1/h	142	142
5516	pVR1012x/s R5(SA-C)gp145(dCFI)dV12/h	pVR1012x/s R5 gp145(dCFI) SA dv12/h	143	143
5517	pVR1012x/s R5(SA-C)gp145(dCFI)dV123/h	pVR1012x/s R5 gp145(dCFI) SA dv123/h	144	144
5518	pVR1012x/s R5(SA-C)gp145(dCFI)dV1234/h	pVR1012x/s R5 gp145(dCFI) SA dv1234/h	145	145
5519	pVR1012x/s R5(SA-C)gp145(dCFI)dV2/h	pVR1012x/s R5 gp145(dCFI) SA dv2/h	146	146
5520	pVR1012x/s R5(SA-C)gp145(dCFI)dV23/h	pVR1012x/s R5 gp145(dCFI) SA dv23/h	147	147
5521	pVR1012x/s R5(SA-C)gp145(dCFI)dV234/h	pVR1012x/s R5 gp145(dCFI) SA dv234/h	148	148
5522	pVR1012x/s R5(SA-C)gp145(dCFI)dV24/h	pVR1012x/s R5 gp145(dCFI) SA dv24/h	149	149
5523	pVR1012x/s R5(SA-C)gp145(dCFI)dV3/h	pVR1012x/s R5 gp145(dCFI) SA dv3/h	150	150
5524	pVR1012x/s R5(SA-C)gp145(dCFI)dV34/h	pVR1012x/s R5 gp145(dCFI) SA dv34/h	151	151
5525	pVR1012x/s R5(SA-C)gp145(dCFI)dV4/h	pVR1012x/s R5 gp145(dCFI) SA dv4/h	152	152
5526	pVR1012x/s R5(SA-C)gp145(dCFI)dV13/h	pVR1012x/s R5 gp145(dCFI) SA dv13/h	153	153
5527	pVR1012x/s R5(SA-C)gp145(dCFI)dV134/h	pVR1012x/s R5 gp145(dCFI) SA dv134/h	154	154
5528	pVR1012x/s R5(SA-C)gp145(dCFI)dV124/h	pVR1012x/s R5 gp145(dCFI) SA dv124/h	155	155
5529	pVR1012x/s R5(SA-C)gp145(dCFI)dV14/h	pVR1012x/s R5 gp145(dCFI) SA dv14/h	156	156

Gag/Pol Plasmids				
Plasmid	Plasmid Name/Description	Plasmid Map Name	SEQ ID NO	Figure
3900	pVR1012x/s HIV Gag /h	pVR1012x/s Gag/h	157	157
3901	pVR1012x/s SIV Gag /h	pVR1012x/s SIV Gag/h	158	158
4000	pVR1012x/s HIV Gag-Pol ΔFS ΔPR /h **OR** pVR1012x/s Gag-Pol/h	pVR1012x/s Gag-PoldeltaFSdeltaPr/h	159	159
4001	pVR1012x/s SIV Gag-Pol /h	pVR1012x/s SIV Gag-Pol/h	160	160
4100	pVR1012x/s HIV Pol /h	pVR1012x/s Pol/h	161	161
4101	pVR1012x/s SIV Pol /h	pVR1012x/s SIV Pol/h	162	162
4200	pVR1012x/s HIV Gag-Pol /h	pVR1012x/s Gag(fs)Pol/h	163	163
4300	pVR1012x/s HIV Gag-Pol ΔRT ΔIN /h **OR** pVR1012 Gag-Pol(d delta RT delta IN)/h	pVR1012x/s Gag-Pol(fs)RT(-)IN(-)	164	164
4301	pVR1012x/s-Gag(FS)-Pol-delta RT IN-IRES-R5 gp157-Nef	pVR1012x/s-Gag(FS)-Pol-delta RT IN-IRES-R5 gp157-Nef	165	165
4302	pVR1012x/s HIV gag-Pol ΔFS ΔPR ΔRT ΔIN /h	pVR1012x/s Gag(delFS)Pol (delta PR delta RT delta IN)/h	166	166
4303	pVR1012x/s SIV Gag-Pol ΔFS /h **OR** pVR1012 SIV Gag(delFS)Pol(delta PR delta RT delta IN)/h	pVR1012x/s SIV Gag(delFS)-Pol/h	167	167
4304	pVR1012 Gag (delFS)Pol delta PR delta RT delta IN/h	pVR1012 Gag-C(delFS) Pol (deltaPR deltaRT deltaIN)/h	168	168
4305	pVR1012 Gag-A(delFS)Pol(delta PR delta RT delta IN)/h	pVR1012 Gag-A(delFS) Pol (deltaPR delta RT deltaIN)/h	169	169
4306	pVR1012 Gag(delFS)Pol delta PR delta RT delta IN/Nef/h	pVR1012 Gag(delFS)Pol deltaPR deltaRT deltaIN/Nef/h	170	170
4308	pVR1012 Gag (delFS) Pol deltaPR deltaRT deltaIN deltaMyr/h	pVR1012 Gag(delFS)Pol deltaPR deltaRT deltaIN delta Myr /h	171	171
4309	pVR1012 Gag (delFS) Pol deltaPR deltaRT deltaIN delta Myr/Nef/h	pVR1012x/s Gag(delFS)Pol deltaPR deltaRT deltaIN delta Myr/Nef/h	172	172
4310	pVR1012 Nef Gag (del fs) (del Myr) Pol (delta PR delta RT delta IN)/h	pVR1012 Nef Gag(delFS)(del Myr) Pol (delta PR delta RT delta IN)/h	173	173
4311	pVR1012 Gag-C(delFS)Pol(delta PR delta RT delta IN) Nef/h	pVR1012 Gag-C(del PS) Pol(delta PR dalta RT delta IN) Nef/h	174	174
4312	Gag (del fs) (del Myr) Nef Pol ΔPRΔRTΔIN/h	pVR1012 Gag (del FS) (del Myr) Nef Pol (delta PR delta RT delta IN)/h	175	175
4313	pVR1012 Gag Clade A (del fs)Pol(Δ PR Δ RT Δ IN)/h	pVR1012 Gag-A (del FS) Pol (delPR delRT delIN) Nef/h	176	176

Detailed Description of the Invention

The present invention provides modifications of HIV Env, Gag, Pol, and Nef that enhance immunogenicity for genetic immunization. Both HIV and SIV are genetically related members of the lentivirus genus of the *Retroviridae* family. Lentivirus isolates from humans are grouped into one of two types, designated HIV-1 and HIV-2. A classification scheme recognizes nine subtypes (clades) of HIV-1 (A through I) and five subtypes of HIV-2 (A through E). A compendium of HIV and SIV sequence information is found in a database prepared by Myers et al., Los Alamos, NM: Los Alamos National Laboratory.

Nucleic Acid Molecules

As indicated herein, nucleic acid molecules of the present invention may be in the form of RNA or in the form of DNA obtained by cloning or produced synthetically. The DNA may be double-stranded or single-stranded. Single-stranded DNA or RNA may be the coding strand, also known as the sense strand, or it may be the non-coding strand, also referred to as the anti-sense strand.

By "isolated" nucleic acid molecule(s) is intended a nucleic acid molecule, DNA or RNA, which has been removed from its native environment. For example, recombinant DNA molecules contained in a vector are considered isolated for the purposes of the present invention. Further examples of isolated DNA molecules include recombinant DNA molecules maintained in heterologous host cells or purified (partially or substantially) DNA molecules in solution. Isolated RNA molecules include in vivo or in vitro RNA transcripts of the DNA molecules of the present invention. Isolated nucleic acid molecules according to the present invention further include such molecules produced synthetically.

Nucleic acid molecules of the present invention include DNA molecules comprising an open reading frame (ORF) of a wild-type HIV gene; and DNA molecules which comprise a sequence substantially different from those described above but which, due to the degeneracy of the genetic code, still encode an ORF of a wild-type HIV polypeptide. Of course, the genetic code is well known in the art. Degenerate variants optimized for human codon usage are preferred.

In another aspect, the invention provides a nucleic acid molecule comprising a polynucleotide which hybridizes under stringent hybridization conditions to a portion of the polynucleotide in a nucleic acid molecule of the invention described above. By "stringent hybridization conditions" is intended overnight incubation at 42 degree C in a solution comprising: 50% formamide, 5 times SSC (750 mM NaCl, 75

mM trisodium citrate), 50 mM sodium phosphate (pH 7.6), 5 times Denhardt's solution, 10% dextran sulfate, and 20 µg/ml denatured, sheared salmon sperm DNA, followed by washing the filters in 0.1 times SSC at about 65 degree C.

By a polynucleotide which hybridizes to a "portion" of a polynucleotide is intended a polynucleotide (either DNA or RNA) hybridizing to at least about 15 nucleotides (nt), and more preferably at least about 20 nt, still more preferably at least about 30 nt, and even more preferably about 30-70 nt of the reference polynucleotide.

By a portion of a polynucleotide of "at least 20 nt in length," for example, is intended 20 or more contiguous nucleotides from the nucleotide sequence of the reference polynucleotide. Of course, a polynucleotide which hybridizes only to a complementary stretch of T (or U) resides, would not be included in a polynucleotide of the invention used to hybridize to a portion of a nucleic acid of the invention, since such a polynucleotide would hybridize to any nucleic acid molecule containing a poly T (or U) stretch or the complement thereof (e.g., practically any double-stranded DNA clone).

As indicated herein, nucleic acid molecules of the present invention which encode an HIV polypeptide may include, but are not limited to those encoding the amino acid sequence of the full-length polypeptide, by itself, the coding sequence for the full-length polypeptide and additional sequences, such as those encoding a leader or secretory sequence, such as a pre-, or pro- or prepro-protein sequence, the coding sequence of the full-length polypeptide, with or without the aforementioned additional coding sequences, together with additional, non-coding sequences, including for example, but not limited to introns and non-coding 5' and 3' sequences, such as the transcribed, non-translated sequences that play a role in transcription, mRNA processing, including splicing and polyadenylation signals, for example, ribosome binding and stability of mRNA; and additional coding sequence which codes for additional amino acids, such as those which provide additional functionalities.

The present invention further relates to variants of the nucleic acid molecules of the present invention, which encode portions, analogs or derivatives of the HIV protein. Variants may occur naturally, such as a natural allelic variant. By an "allelic variant" is intended one of several alternate forms of a gene occupying a given locus on a genome of an organism. Genes II, Lewin, B., ed., John Wiley & Sons, New

York (1985). Non-naturally occurring variants may be produced using art-known mutagenesis techniques.

Such variants include those produced by nucleotide substitutions, deletions or additions, which may involve one or more nucleotides. The variants may be altered in coding regions, non-coding regions, or both. Alterations in the coding regions may produce conservative or non-conservative amino acid substitutions, deletions or additions. Especially preferred among these are silent substitutions, additions and deletions, which do not alter the properties and activities of the HIV polypeptide or portions thereof. Also especially preferred in this regard are conservative substitutions.

Further embodiments of the invention include nucleic acid molecules comprising a polynucleotide having a nucleotide sequence at least 95% identical, and more preferably at least 96%, 97%, 98% or 99% identical to a nucleotide sequence encoding a polypeptide having the amino acid sequence of a wild-type HIV polypeptide or a nucleotide sequence complementary thereto.

By a polynucleotide having a nucleotide sequence at least, for example, 95% "identical" to a reference nucleotide sequence encoding a HIV polypeptide is intended that the nucleotide sequence of the polynucleotide is identical to the reference sequence except that the polynucleotide sequence may include up to five point mutations per each 100 nucleotides of the reference nucleotide sequence encoding the HIV polypeptide. In other words, to obtain a polynucleotide having a nucleotide sequence at least 95% identical to a reference nucleotide sequence, up to 5% of the nucleotides in the reference sequence may be deleted or substituted with another nucleotide, or a number of nucleotides up to 5% of the total nucleotides in the reference sequence may be inserted into the reference sequence. These mutations of the reference sequence may occur at the 5' or 3' terminal positions of the reference nucleotide sequence or anywhere between those terminal positions, interspersed either individually among nucleotides in the reference sequence or in one or more contiguous groups within the reference sequence.

As a practical matter, whether any particular nucleic acid molecule is at least 95%, 96%, 97%, 98% or 99% identical to the reference nucleotide sequence can be determined conventionally using known computer programs such as the Bestfit program (Wisconsin Sequence Analysis Package, Version 8 for Unix, Genetics Computer Group, University Research Park, 575 Science Drive, Madison, Wis. 53711). Bestfit uses the local homology algorithm of Smith and Waterman,

Advances in Applied Mathematics 2: 482-489 (1981), to find the best segment of homology between two sequences. When using Bestfit or any other sequence alignment program to determine whether a particular sequence is, for instance, 95% identical to a reference sequence according to the present invention, the parameters are set, of course, such that the percentage of identity is calculated over the full length of the reference nucleotide sequence and that gaps in homology of up to 5% of the total number of nucleotides in the reference sequence are allowed.

The present application is directed to nucleic acid molecules at least 95%, 96%, 97%, 98% or 99% identical to the nucleic acid sequences shown herein in the Sequence Listing which encode a polypeptide having HIV polypeptide activity. By "a polypeptide having HIV activity" is intended polypeptides exhibiting HIV activity in a particular biological assay. For example, Env, Gag, and Pol protein activity can be measured for changes in immunological character by an appropriate immunological assay.

Of course, due to the degeneracy of the genetic code, one of ordinary skill in the art will immediately recognize that a large number of the nucleic acid molecules having a sequence at least 95%, 96%, 97%, 98%, or 99% identical to a nucleic acid sequence shown herein in the Sequence Listing will encode a polypeptide "having HIV polypeptide activity." In fact, since degenerate variants of these nucleotide sequences all encode the same polypeptide, this will be clear to the skilled artisan even without performing the above described comparison assay. It will be further recognized in the art that, for such nucleic acid molecules that are not degenerate variants, a reasonable number will also encode a polypeptide having HIV polypeptide activity. This is because the skilled artisan is fully aware of amino acid substitutions that are either less likely or not likely to significantly effect protein function (e.g., replacing one aliphatic amino acid with a second aliphatic amino acid).

For example, guidance concerning how to make phenotypically silent amino acid substitutions is provided in Bowie, J. U. et al., "Deciphering the Message in Protein Sequences: Tolerance to Amino Acid Substitutions," Science 247:1306-1310 (1990), wherein the authors indicate that proteins are surprisingly tolerant of amino acid substitutions.

Polypeptides and Fragments

The invention further provides a HIV polypeptide having the amino acid sequence encoded by an open reading frame (ORF) of a wild-type HIV gene, or a peptide or polypeptide comprising a portion thereof (e.g., gp120).

It will be recognized in the art that some amino acid sequences of the HIV polypeptides can be varied without significant effect of the structure or function of the protein. If such differences in sequence are contemplated, it should be remembered that there will be critical areas on the protein which determine activity.

Thus, the invention further includes variations of the HIV polypeptide which show substantial HIV polypeptide activity or which include regions of HIV protein such as the protein portions discussed below. Such mutants include deletions, insertions, inversions, repeats, and type substitutions. As indicated, guidance concerning which amino acid changes are likely to be phenotypically silent can be found in Bowie, J. U., et al., "Deciphering the Message in Protein Sequences: Tolerance to Amino Acid Substitutions," Science 247:1306-1310 (1990).

Thus, the fragment, derivative or analog of the polypeptide of the invention may be (i) one in which one or more of the amino acid residues are substituted with a conserved or non-conserved amino acid residue (preferably a conserved amino acid residue) and such substituted amino acid residue may or may not be one encoded by the genetic code, or (ii) one in which one or more of the amino acid residues includes a substituent group, or (iii) one in which additional amino acids are fused to the mature polypeptide, such as an IgG Fc fusion region peptide or leader or secretory sequence or a sequence which is employed for purification of the mature polypeptide or a proprotein sequence. Such fragments, derivatives and analogs are deemed to be within the scope of those skilled in the art from the teachings herein.

As indicated, changes are preferably of a minor nature, such as conservative amino acid substitutions that do not significantly affect the folding or activity of the protein (see Table A).

Table A

Conservative Amino Acid Substitutions

Aromatic	Phenylalanine Tryptophan Tyrosine
Ionizable: Acidic	Aspartic Acid Glutamic Acid
Ionizable: Basic	Arginine Histidine Lysine
Nonionizable Polar	Asparagine Glutamine Selenocystine Serine Threonine
Nonpolar (Hydrophobic)	Alanine Glycine Isoleucine Leucine Proline Valine
Sulfur Containing	Cysteine Methionine

Of course, the number of amino acid substitutions a skilled artisan would make depends on many factors, including those described above. Generally speaking, the number of amino acid substitutions for any given HIV polypeptide will not be more than 50, 40, 30, 20, 10, 5 or 3.

Amino acids in the HIV polypeptides of the present invention that are essential for function can be identified by methods known in the art, such as site-directed mutagenesis or alanine-scanning mutagenesis (Cunningham and Wells, Science 244:1081-1085 (1989)). The latter procedure introduces single alanine mutations at every residue in the molecule. The resulting mutant molecules are then tested for biological activity such as changes in immunological character.

The polypeptides of the present invention are conveniently provided in an isolated form. By "isolated polypeptide" is intended a polypeptide removed from its native environment. Thus, a polypeptide produced and/or contained within a recombinant host cell is considered isolated for purposes of the present invention.

Also intended as an "isolated polypeptide" are polypeptides that have been purified, partially or substantially, from a recombinant host cell or a native source. For example, a recombinantly produced version of the HIV polypeptide can be substantially purified by the one-step method described in Smith and Johnson, Gene 67:31-40 (1988).

The polypeptides of the present invention include a polypeptide comprising a polypeptide shown herein in the Sequence Listing; as well as polypeptides which are at least 95% identical, and more preferably at least 96%, 97%, 98% or 99% identical to those described above and also include portions of such polypeptides with at least 30 amino acids and more preferably at least 50 amino acids.

By a polypeptide having an amino acid sequence at least, for example, 95% "identical" to a reference amino acid sequence of an HIV polypeptide is intended that the amino acid sequence of the polypeptide is identical to the reference sequence except that the polypeptide sequence may include up to five amino acid alterations per each 100 amino acids of the reference amino acid of the HIV polypeptide. In other words, to obtain a polypeptide having an amino acid sequence at least 95% identical to a reference amino acid sequence, up to 5% of the amino acid residues in the reference sequence may be deleted or substituted with another amino acid, or a number of amino acids up to 5% of the total amino acid residues in the reference sequence may be inserted into the reference sequence. These alterations of the reference sequence may occur at the amino or carboxy terminal positions of the reference amino acid sequence or anywhere between those terminal positions, interspersed either individually among residues in the reference sequence or in one or more contiguous groups within the reference sequence.

As a practical matter, whether any particular polypeptide is at least 95%, 96%, 97%, 98% or 99% identical to, for instance, the amino acid sequence shown herein in the Sequence Listing can be determined conventionally using known computer programs such the Bestfit program (Wisconsin Sequence Analysis Package, Version 8 for Unix, Genetics Computer Group, University Research Park, 575 Science Drive, Madison, Wis. 53711). When using Bestfit or any other sequence alignment program to determine whether a particular sequence is, for

instance, 95% identical to a reference sequence according to the present invention, the parameters are set, of course, such that the percentage of identity is calculated over the full length of the reference amino acid sequence and that gaps in homology of up to 5% of the total number of amino acid residues in the reference sequence are allowed.

The polypeptides of the invention may be produced by any conventional means. Houghten, R. A. (1985) General method for the rapid solid-phase synthesis of large numbers of peptides: specificity of antigen-antibody interaction at the level of individual amino acids. Proc. Natl. Acad. Sci. USA 82:5131-5135. This "Simultaneous Multiple Peptide Synthesis (SMPS)" process is further described in U.S. Pat. No. 4,631,211 to Houghten et al. (1986).

The present invention also relates to vectors which include the nucleic acid molecules of the present invention, host cells which are genetically engineered with the recombinant vectors, and the production of HIV polypeptides or fragments thereof by recombinant techniques.

The polynucleotides may be joined to a vector containing a selectable marker for propagation in a host. Generally, a plasmid vector is introduced in a precipitate, such as a calcium phosphate precipitate, or in a complex with a charged lipid. If the vector is a virus, it may be packaged in vitro using an appropriate packaging cell line and then transduced into host cells.

The DNA insert should be operatively linked to an appropriate promoter, such as the phage lambda PL promoter, the E. coli lac, trp and tac promoters, the SV40 early and late promoters and promoters of retroviral LTRs, to name a few. Other suitable promoters will be known to the skilled artisan. The expression constructs will further contain sites for transcription initiation, termination and, in the transcribed region, a ribosome binding site for translation. The coding portion of the mature transcripts expressed by the constructs will preferably include a translation initiating at the beginning and a termination codon (UAA, UGA or UAG) appropriately positioned at the end of the polypeptide to be translated.

As indicated, the expression vectors will preferably include at least one selectable marker. Such markers include dihydrofolate reductase or neomycin resistance for eukaryotic cell culture and tetracycline or ampicillin resistance genes for culturing in E. coli and other bacteria. Representative examples of appropriate hosts include, but are not limited to, bacterial cells, such as E. coli, Streptomyces and Salmonella typhimurium cells; fungal cells, such as yeast cells; insect cells such

as Drosophila S2 and Spodoptera Sf9 cells; animal cells such as CHO, COS and Bowes melanoma cells; and plant cells. Appropriate culture mediums and conditions for the above-described host cells are known in the art.

Among vectors preferred for use in bacteria include pQE70, pQE60 and pQE-9, available from Qiagen; pBS vectors, Phagescript vectors, Bluescript vectors, pNH8A, pNH16a, pNH18A, pNH46A, available from Stratagene; and ptrc99a, pKK223-3, pKK233-3, pDR540, pRIT5 available from Pharmacia. Among preferred eukaryotic vectors are pWLNEO, pSV2CAT, pOG44, pXT1 and pSG available from Stratagene; and pSVK3, pBPV, pMSG and pSVL available from Pharmacia. Other suitable vectors will be readily apparent to the skilled artisan.

Introduction of the construct into the host cell can be effected by calcium phosphate transfection, DEAE-dextran mediated transfection, cationic lipid-mediated transfection, electroporation, transduction, infection or other methods. Such methods are described in many standard laboratory manuals, such as Davis et al., Basic Methods In Molecular Biology (1986).

The HIV polypeptide can be recovered and purified from recombinant cell cultures by well-known methods including ammonium sulfate or ethanol precipitation, acid extraction, anion or cation exchange chromatography, phosphocellulose chromatography, hydrophobic interaction chromatography, affinity chromatography, hydroxylapatite chromatography and lectin chromatography. Most preferably, high performance liquid chromatography ("HPLC") is employed for purification. Polypeptides of the present invention include naturally purified products, products of chemical synthetic procedures, and products produced by recombinant techniques from a prokaryotic or eukaryotic host, including, for example, bacterial, yeast, higher plant, insect and mammalian cells. Depending upon the host employed in a recombinant production procedure, the polypeptides of the present invention may be glycosylated or may be non-glycosylated. In addition, polypeptides of the invention may also include an initial modified methionine residue, in some cases as a result of host-mediated processes.

Pharmaceutical Formulations, Dosages, and Modes of Administration

The compounds of the invention may be administered using techniques well known to those in the art. Preferably, compounds are formulated and administered by genetic immunization. Techniques for formulation and administration may be found in "Remington's Pharmaceutical Sciences", 18th ed., 1990, Mack Publishing Co., Easton, PA. Suitable routes may include parenteral delivery, such as

intramuscular, intradermal, subcutaneous, intramedullary injections, as well as, intrathecal, direct intraventricular, intravenous, intraperitoneal, intranasal, or intraocular injections, just to name a few. For injection, the compounds of the invention may be formulated in aqueous solutions, preferably in physiologically compatible buffers such as Hanks' solution, Ringer's solution, or physiological saline buffer.

In instances wherein intracellular administration of the compounds of the invention is preferred, techniques well known to those of ordinary skill in the art may be utilized. For example, such compounds may be encapsulated into liposomes, then administered as described above. Liposomes are spherical lipid bilayers with aqueous interiors. All molecules present in an aqueous solution at the time of liposome formation are incorporated into the aqueous interior. The liposomal contents are both protected from the external microenvironment and, because liposomes fuse with cell membranes, are effectively delivered into the cell cytoplasm.

Nucleotide sequences of the invention which are to be intracellularly administered may be expressed in cells of interest, using techniques well known to those of skill in the art. For example, expression vectors derived from viruses such as retroviruses, adenoviruses, adeno-associated viruses, herpes viruses, vaccinia viruses, polio viruses, or sindbis or other RNA viruses, or from plasmids may be used for delivery and expression of such nucleotide sequences into the targeted cell population. Methods for the construction of such expression vectors are well known. See, for example, Sambrook et al., 1989, Molecular Cloning, A Laboratory Manual, Cold Spring Harbor Press, Cold Spring Harbor, NY, and Ausubel et al., 1989, Current Protocols In Molecular Biology, Greene Publishing Associates and Wiley Interscience, NY.

The invention extends to the use of a plasmid for primary immunization (priming) of a host and the subsequent use of a recombinant virus, such as a retrovirus, adenovirus, adeno-associated virus, herpes virus, vaccinia virus, polio virus, or sindbis or other RNA virus, for boosting said host, and vice versa. For example, the host may be immunized (primed) with a plasmid by DNA immunization and receive a boost with the corresponding viral construct, and vice versa. Alternatively, the host may be immunized (primed) with a plasmid by DNA immunization and receive a boost with not the corresponding viral construct but a different viral construct, and vice versa.

With respect to HIV Env, Gag, and Pol, protein sequences of the invention may be used as therapeutics or prophylatics (as subunit vaccines) in the treatment of AIDS or HIV infection. A therapeutically effective dose refers to that amount of the compound sufficient to result in amelioration of symptoms or a prolongation of survival in a patient. Toxicity and therapeutic efficacy of such compounds can be determined by standard pharmaceutical procedures in cell cultures or experimental animals, e.g., for determining the LD50 (the dose lethal to 50% of the population) and the ED50 (the dose therapeutically effective in 50% of the population). The dose ratio between toxic and therapeutic effects is the therapeutic index and it can be expressed as the ratio LD50/ED50. Compounds which exhibit large therapeutic indices are preferred. The data obtained from cell culture assays and animal studies can be used in formulating a range of dosage for use in humans. The dosage of such compounds lies preferably within a range of circulating concentrations that includes the ED50 with little or no toxicity. The dosage may vary within this range depending upon the dosage form employed and the route of administration utilized. For any compound used in the method of the invention, the therapeutically effective dose can be estimated initially from cell culture assays. A dose may be formulated in animal models to achieve a circulating plasma concentration range that includes the IC50 (e.g., the concentration of the test compound which achieves a half-maximal inhibition of viral infection relative to the amount of the event in the absence of the test compound) as determined in cell culture. Such information can be used to more accurately determine useful doses in humans. Levels in plasma may be measured, for example, by high performance liquid chromatography (HPLC).

The compounds of the invention may, further, serve the role of a prophylactic vaccine, wherein the host produces antibodies and/or CTL responses against HIV Env, Gag and Pol, which responses then preferably serve to neutralize HIV viruses by, for example, inhibiting further HIV infection. Administration of the compounds of the invention as a prophylactic vaccine, therefore, would comprise administering to a host a concentration of compounds effective in raising an immune response which is sufficient to elicit antibody and/or CTL reponses to HIV Env, Gag, and Pol, and/or neutralize HIV, by, for example, inhibiting HIV ability to infect cells. The exact concentration will depend upon the specific compound to be administered, but may be determined by using standard techniques for assaying the development of an immune response which are well known to those of ordinary skill in the art.

The compounds may be formulated with a suitable adjuvant in order to enhance the immunological response. Such adjuvants may include, but are not limited to mineral gels such as aluminum hydroxide; surface active substances such as lysolecithin, pluronic polyols, polyanions; other peptides; oil emulsions; and potentially useful human adjuvants such as BCG and Corynebacterium parvum.

Adjuvants suitable for co-administration in accordance with the present invention should be ones that are potentially safe, well tolerated and effective in people including QS-21, Detox-PC, MPL-SE, MoGM-CSF, TiterMax-G, CRL-1005, GERBU, TERamide, PSC97B, Adjumer, PG-026, GSK-1, GcMAF, B-alethine, MPC-026, Adjuvax, CpG ODN, Betafectin, Alum, and MF59 (see Kim et al., 2000, Vaccine, 18: 597 and references therein).

Other contemplated adjuvants that may be administered include lectins, growth factors, cytokines and lymphokines such as alpha-interferon, gamma-interferon, platelet derived growth factor (PDGF), gCSF, gMCSF, TNF, epidermal growth factor (EGF), IL-1, IL-2, IL-4, IL-6, IL-8, IL-10 and IL-12.

For all such treatments described above, the exact formulation, route of administration and dosage can be chosen by the individual physician in view of the patient's condition. (See e.g., Fingl et al., 1975, in "The Pharmacological Basis of Therapeutics", Ch. 1 p. 1).

It should be noted that the attending physician would know how to and when to terminate, interrupt, or adjust administration due to toxicity, or to organ dysfunctions. Conversely, the attending physician would also know to adjust treatment to higher levels if the clinical response were not adequate (precluding toxicity). The magnitude of an administered dose in the management of the viral infection of interest will vary with the severity of the condition to be treated and the route of administration. The dose and perhaps prime-boost regimen, will also vary according to the age, weight, and response of the individual patient. A program comparable to that discussed above may be used in veterinary medicine.

The pharmacologically active compounds of this invention can be processed in accordance with conventional methods of galenic pharmacy to produce medicinal agents for administration to patients, e.g., mammals including humans.

The compounds of this invention can be employed in admixture with conventional excipients, i.e., pharmaceutically acceptable organic or inorganic carrier substances suitable for parenteral, enteral (e.g., oral) or topical application which do not deleteriously react with the active compounds. Suitable

pharmaceutically acceptable carriers include but are not limited to water, salt solutions, alcohols, gum arabic, vegetable oils, benzyl alcohols, polyethylene glycols, gelatine, carbohydrates such as lactose, amylose or starch, magnesium stearate, talc, silicic acid, viscous paraffin, perfume oil, fatty acid monoglycerides and diglycerides, pentaerythritol fatty acid esters, hydroxy methylcellulose, polyvinyl pyrrolidone, etc. The pharmaceutical preparations can be sterilized and if desired mixed with auxiliary agents, e.g., lubricants, preservatives, stabilizers, wetting agents, emulsifiers, salts for influencing osmotic pressure, buffers, coloring, flavoring and/or aromatic substances and the like which do not deleteriously react with the active compounds. They can also be combined where desired with other active agents, e.g., vitamins.

For parenteral application, which includes intramuscular, intradermal, subcutaneous, intranasal, intracapsular, intraspinal, intrasternal, and intravenous injection, particularly suitable are injectable, sterile solutions, preferably oily or aqueous solutions, as well as suspensions, emulsions, or implants, including suppositories. Formulations for injection may be presented in unit dosage form, e.g., in ampoules or in multi-dose containers, with an added preservative. The compositions may take such forms as suspensions, solutions or emulsions in oily or aqueous vehicles, and may contain formulatory agents such as suspending, stabilizing and/or dispersing agents. Alternatively, the active ingredient may be in powder form for constitution with a suitable vehicle, e.g., sterile pyrogen-free water, before use.

For enteral application, particularly suitable are tablets, dragees, liquids, drops, suppositories, or capsules. The pharmaceutical compositions may be prepared by conventional means with pharmaceutically acceptable excipients such as binding agents (e.g., pregelatinised maize starch, polyvinylpyrrolidone or hydroxypropyl methylcellulose); fillers (e.g., lactose, microcrystalline cellulose or calcium hydrogen phosphate); lubricants (e.g., magnesium stearate, talc or silica); disintegrants (e.g., potato starch or sodium starch glycolate); or wetting agents (e.g., sodium lauryl sulphate). The tablets may be coated by methods well known in the art. Liquid preparations for oral administration may take the form of, for example, solutions, syrups or suspensions, or they may be presented as a dry product for constitution with water or other suitable vehicle before use. Such liquid preparations may be prepared by conventional means with pharmaceutically acceptable additives such as suspending agents (e.g., sorbitol syrup, cellulose derivatives or hydrogenated

edible fats); emulsifying agents (e.g., lecithin or acacia); non-aqueous vehicles (e.g., almond oil, oily esters, ethyl alcohol or fractionated vegetable oils); and preservatives (e.g., methyl or propyl-p-hydroxybenzoates or sorbic acid). The preparations may also contain buffer salts, flavoring, coloring and sweetening agents as appropriate. A syrup, elixir, or the like can be used wherein a sweetened vehicle is employed.

Sustained or directed release compositions can be formulated, e.g., liposomes or those wherein the active compound is protected with differentially degradable coatings, e.g., by microencapsulation, multiple coatings, etc. It is also possible to freeze dry the new compounds and use the lyophilizates obtained, for example, for the preparation of products for injection.

For administration by inhalation, the compounds for use according to the present invention are conveniently delivered in the form of an aerosol spray presentation from pressurized packs or a nebulizer, with the use of a suitable propellant, e.g., dichlorodifluoromethane, trichlorofluoromethane, dichlorotetrafluoroethane, carbon dioxide or other suitable gas. In the case of a pressurized aerosol the dosage unit may be determined by providing a valve to deliver a metered amount. Capsules and cartridges of e.g. gelatin for use in an inhaler or insufflator may be formulated containing a powder mix of the compound and a suitable powder base such as lactose or starch.

For topical application, there are employed as non-sprayable forms, viscous to semi-solid or solid forms comprising a carrier compatible with topical application and having a dynamic viscosity preferably greater than water. Suitable formulations include but are not limited to solutions, suspensions, emulsions, creams, ointments, powders, liniments, salves, aerosols, etc., which are, if desired, sterilized or mixed with auxiliary agents, e.g., preservatives, stabilizers, wetting agents, buffers or salts for influencing osmotic pressure, etc. For topical application, also suitable are sprayable aerosol preparations wherein the active ingredient, preferably in combination with a solid or liquid inert carrier material, is packaged in a squeeze bottle or in admixture with a pressurized volatile, normally gaseous propellant, e.g., a freon.

The compositions may, if desired, be presented in a pack or dispenser device which may contain one or more unit dosage forms containing the active ingredient. The pack may for example comprise metal or plastic foil, such as a blister pack. The pack or dispenser device may be accompanied by instructions for administration.

Genetic Immunization

Genetic immunization according to the present invention elicits an effective immune response without the use of infective agents or infective vectors. Vaccination techniques which usually do produce a CTL response do so through the use of an infective agent. A complete, broad based immune response is not generally exhibited in individuals immunized with killed, inactivated or subunit vaccines. The present invention achieves the full complement of immune responses in a safe manner without the risks and problems associated with vaccinations that use infectious agents.

According to the present invention, DNA or RNA that encodes a target protein is introduced into the cells of an individual where it is expressed, thus producing the target protein. The DNA or RNA is linked to regulatory elements necessary for expression in the cells of the individual. Regulatory elements for DNA include a promoter and a polyadenylation signal. In addition, other elements, such as a Kozak region, may also be included in the genetic construct.

The genetic constructs of genetic vaccines comprise a nucleotide sequence that encodes a target protein operably linked to regulatory elements needed for gene expression. Accordingly, incorporation of the DNA or RNA molecule into a living cell results in the expression of the DNA or RNA encoding the target protein and thus, production of the target protein.

When taken up by a cell, the genetic construct which includes the nucleotide sequence encoding the target protein operably linked to the regulatory elements may remain present in the cell as a functioning extrachromosomal molecule or it may integrate into the cell's chromosomal DNA. DNA may be introduced into cells where it remains as separate genetic material in the form of a plasmid. Alternatively, linear DNA which can integrate into the chromosome may be introduced into the cell. When introducing DNA into the cell, reagents which promote DNA integration into chromosomes may be added. DNA sequences which are useful to promote integration may also be included in the DNA molecule. Since integration into the chromosomal DNA necessarily requires manipulation of the chromosome, it is preferred to maintain the DNA construct as a replicating or non-replicating extrachromosomal molecule. This reduces the risk of damaging the cell by splicing into the chromosome without affecting the effectiveness of the vaccine. Alternatively, RNA may be administered to the cell. It is also contemplated to

provide the genetic construct as a linear minichromosome including a centromere, telomeres and an origin of replication.

The necessary elements of a genetic construct of a genetic vaccine include a nucleotide sequence that encodes a target protein and the regulatory elements necessary for expression of that sequence in the cells of the vaccinated individual. The regulatory elements are operably linked to the DNA sequence that encodes the target protein to enable expression.

The molecule that encodes a target protein is a protein-encoding molecule which is translated into protein. Such molecules include DNA or RNA which comprise a nucleotide sequence that encodes the target protein. These molecules may be cDNA, genomic DNA, synthesized DNA or a hybrid thereof or an RNA molecule such as mRNA. Accordingly, as used herein, the terms "DNA construct", "genetic construct" and "nucleotide sequence" are meant to refer to both DNA and RNA molecules.

The regulatory elements necessary for gene expression of a DNA molecule include: a promoter, an initiation codon, a stop codon, and a polyadenylation signal. In addition, enhancers are often required for gene expression. It is necessary that these elements be operable in the vaccinated individual. Moreover, it is necessary that these elements be operably linked to the nucleotide sequence that encodes the target protein such that the nucleotide sequence can be expressed in the cells of a vaccinated individual and thus the target protein can be produced.

Initiation codons and stop codons are generally considered to be part of a nucleotide sequence that encodes the target protein. However, it is necessary that these elements are functional in the vaccinated individual.

Similarly, promoters and polyadenylation signals used must be functional within the cells of the vaccinated individual.

Examples of promoters useful to practice the present invention, especially in the production of a genetic vaccine for humans, include but are not limited to promoters from Simian Virus 40 (SV40), Mouse Mammary Tumor Virus (MMTV) promoter, Human Immunodeficiency Virus (HIV) such as the HIV Long Terminal Repeat (LTR) promoter, Moloney virus, ALV, Cytomegalovirus (CMV) such as the CMV immediate early promoter, Epstein Barr Virus (EBV), Rous Sarcoma Virus (RSV) as well as promoters from human genes such as human Actin, human Myosin, human Hemoglobin, human muscle creatine and human metalothionein.

Examples of polyadenylation signals useful to practice the present invention, especially in the production of a genetic vaccine for humans, include but are not limited to SV40 polyadenylation signals and LTR polyadenylation signals. In particular, the SV40 polyadenylation signal which is in pCEP4 plasmid (Invitrogen, San Diego Calif.), referred to as the SV40 polyadenylation signal, can be used.

In addition to the regulatory elements required for DNA expression, other elements may also be included in the DNA molecule. Such additional elements include enhancers. The enhancer may be selected from the group including but not limited to: human Actin, human Myosin, human Hemoglobin, human muscle creatine and viral enhancers such as those from CMV, RSV and EBV.

Genetic constructs can be provided with mammalian origin of replication in order to maintain the construct extrachromosomally and produce multiple copies of the construct in the cell. Plasmids pCEP4 and pREP4 from Invitrogen (San Diego, Calif.) contain the Epstein Barr virus origin of replication and nuclear antigen EBNA-1 coding region which produces high copy episomal replication without integration.

An additional element may be added which serves as a target for cell destruction if it is desirable to eliminate cells receiving the genetic construct for any reason. A herpes thymidine kinase (tk) gene in an expressible form can be included in the genetic construct. When the construct is introduced into the cell, tk will be produced. The drug gangcyclovir can be administered to the individual and that drug will cause the selective killing of any cell producing tk. Thus, a system can be provided which allows for the selective destruction of vaccinated cells.

In order to be a functional genetic construct, the regulatory elements must be operably linked to the nucleotide sequence that encodes the target protein. Accordingly, it is necessary for the initiation and termination codons to be in frame with the coding sequence.

Open reading frames (ORFs) encoding the protein of interest and another or other proteins of interest may be introduced into the cell on the same vector or on different vectors. ORFs on a vector may be controlled by separate promoters or by a single promoter. In the latter arrangement, which gives rise to a polycistronic message, the ORFs will be separated by translational stop and start signals. The presence of an internal ribosome entry site (IRES) site between these ORFs permits the production of the expression product originating from the second ORF of

interest, or third, etc. by internal initiation of the translation of the bicistronic or polycistronic mRNA.

According to the invention, the genetic vaccine may be administered directly into the individual to be immunized or ex vivo into removed cells of the individual which are reimplanted after administration. By either route, the genetic material is introduced into cells which are present in the body of the individual. Routes of administration include, but are not limited to, intramuscular, intraperitoneal, intradermal, subcutaneous, intravenous, intraarterially, intraoccularly and oral as well as transdermally or by inhalation or suppository. Preferred routes of administration include intramuscular, intraperitoneal, intradermal and subcutaneous injection. Genetic constructs may be administered by means including, but not limited to, traditional syringes, needleless injection devices, or microprojectile bombardment gene guns. Alternatively, the genetic vaccine may be introduced by various means into cells that are removed from the individual. Such means include, for example, ex vivo transfection, electroporation, microinjection and microprojectile bombardment. After the genetic construct is taken up by the cells, they are reimplanted into the individual. It is contemplated that otherwise non-immunogenic cells that have genetic constructs incorporated therein can be implanted into the individual even if the vaccinated cells were originally taken from another individual.

The genetic vaccines according to the present invention comprise about 1 nanogram to about 1000 micrograms of DNA. In some preferred embodiments, the vaccines contain about 10 nanograms to about 800 micrograms of DNA. In some preferred embodiments, the vaccines contain about 0.1 to about 500 micrograms of DNA. In some preferred embodiments, the vaccines contain about 1 to about 350 micrograms of DNA. In some preferred embodiments, the vaccines contain about 25 to about 250 micrograms of DNA. In some preferred embodiments, the vaccines contain about 100 micrograms DNA.

The genetic vaccines according to the present invention are formulated according to the mode of administration to be used. One having ordinary skill in the art can readily formulate a genetic vaccine that comprises a genetic construct. In cases where intramuscular injection is the chosen mode of administration, an isotonic formulation is preferably used. Generally, additives for isotonicity can include sodium chloride, dextrose, mannitol, sorbitol and lactose. In some cases, isotonic solutions such as phosphate buffered saline are preferred. Stabilizers include

gelatin and albumin. In some embodiments, a vaso-constriction agent is added to the formulation. The pharmaceutical preparations according to the present invention are provided sterile and pyrogen free.

Genetic constructs may optionally be formulated with one or more response enhancing agents such as: compounds which enhance transfection, i.e. transfecting agents; compounds which stimulate cell division, i.e. replication agents; compounds which stimulate immune cell migration to the site of administration, i.e. inflammatory agents; compounds which enhance an immune response, i.e. adjuvants or compounds having two or more of these activities.

In one embodiment, bupivacaine, a well known and commercially available pharmaceutical compound, is administered prior to, simultaneously with or subsequent to the genetic construct. Bupivacaine and the genetic construct may be formulated in the same composition. Bupivacaine is particularly useful as a cell stimulating agent in view of its many properties and activities when administered to tissue. Bupivacaine promotes and facilitates the uptake of genetic material by the cell. As such, it is a transfecting agent. Administration of genetic constructs in conjunction with bupivacaine facilitates entry of the genetic constructs into cells. Bupivacaine is believed to disrupt or otherwise render the cell membrane more permeable. Cell division and replication is stimulated by bupivacaine. Accordingly, bupivacaine acts as a replicating agent. Administration of bupivacaine also irritates and damages the tissue. As such, it acts as an inflammatory agent which elicits migration and chemotaxis of immune cells to the site of administration. In addition to the cells normally present at the site of administration, the cells of the immune system which migrate to the site in response to the inflammatory agent can come into contact with the administered genetic material and the bupivacaine. Bupivacaine, acting as a transfection agent, is available to promote uptake of genetic material by such cells of the immune system as well.

In addition to bupivacaine, mepivacaine, lidocaine, procains, carbocaine, methyl bupivacaine, and other similarly acting compounds may be used as response enhancing agents. Such agents acts a cell stimulating agents which promote the uptake of genetic constructs into the cell and stimulate cell replication as well as initiate an inflammatory response at the site of administration.

Other contemplated response enhancing agents which may function as transfecting agents and/or replicating agents and/or inflammatory agents and which may be administered include lectins, growth factors, cytokines and lymphokines

such as alpha-interferon, gamma-interferon, platelet derived growth factor (PDGF), gCSF, gMCSF, TNF, epidermal growth factor (EGF), IL-1, IL-2, IL-4, IL-6, IL-8, IL-10 and IL-12 as well as collagenase, fibroblast growth factor, estrogen, dexamethasone, saponins, surface active agents such as immune-stimulating complexes (ISCOMS), Freund's incomplete adjuvant, LPS analog including monophosphoryl Lipid A (MPL), muramyl peptides, quinone analogs and vesicles such as squalene and squalane, hyaluronic acid and hyaluronidase may also be used administered in conjunction with the genetic construct. In some embodiments, combinations of these agents are co-administered in conjunction with the genetic construct. In other embodiments, genes encoding these agents are included in the same or different genetic construct(s) for co-expression of the agents.

With respect to HIV Env, Gag, and Pol nucleotide sequences of the invention, particularly through genetic immunization, may be used as therapeutics or prophylatics in the treatment of AIDS or HIV infection. A therapeutically effective dose refers to that amount of the compound sufficient to result in amelioration of symptoms or a prolongation of survival in a patient. Toxicity and therapeutic efficacy of such compounds can be determined by standard pharmaceutical procedures in cell cultures or experimental animals, e.g., for determining the LD50 (the dose lethal to 50% of the population) and the ED50 (the dose therapeutically effective in 50% of the population). The dose ratio between toxic and therapeutic effects is the therapeutic index and it can be expressed as the ratio LD50/ED50. Compounds which exhibit large therapeutic indices are preferred. The data obtained from cell culture assays and animal studies can be used in formulating a range of dosage for use in humans. The dosage of such compounds lies preferably within a range of circulating concentrations that includes the ED50 with little or no toxicity. The dosage may vary within this range depending upon the dosage form employed and the route of administration utilized. For any compound used in the method of the invention, the therapeutically effective dose can be estimated initially from cell culture assays. A dose may be formulated in animal models to achieve a circulating plasma concentration range that includes the (e.g., the concentration of the test compound which achieves a half-maximal inhibition of viral infection relative to the amount of the event in the absence of the test compound) as determined in cell culture. Such information can be used to more accurately determine useful doses in humans. Levels in plasma may be measured, for example, by high performance liquid chromatography (HPLC).

The compounds (for genetic immunization) of the invention may, further, serve the role of a prophylactic vaccine, wherein the host produces antibodies and/or CTL responses against HIV Env, Gag, and Pol which responses then preferably serve to neutralize HIV viruses by, for example, inhibiting further HIV infection. Administration of the compounds of the invention as a prophylactic vaccine, therefore, would comprise administering to a host a concentration of compounds effective in raising an immune response which is sufficient to elicit antibody and/or CTL reponses to HIV Env, Gag, and Pol and/or neutralize HIV, by, for example, inhibiting HIV ability to infect cells. The exact concentration will depend upon the specific compound to be administered, but may be determined by using standard techniques for assaying the development of an immune response which are well known to those of ordinary skill in the art.

Env

To improve the immune response to native gp160 and to expose the core protein for optimal antigen presentation and recognition, we have analyzed the immune response to modified forms of the protein. The role of conserved N-linked glycosylation sites has been studied, and analogues of fusion intermediates have been developed. Expression vectors with deletions in the cleavage site (C), the fusion peptide (F), and the interspace (I) between the two heptad repeats were termed ΔCFI. Plasmid DNA vaccination has been a useful technology for the development and analysis of immunogens. This method of vaccination allows appropriate post-translational modification, proper intracellular trafficking, and antigen presentation. Direct injection of naked DNA either intramuscularly or intradermally in rodents induces immune responses, and the ability to easily modify plasmid expression vectors to express different forms of HIV envelope proteins enables rapid and systematic testing of vaccine immunogens. In this disclosure, we have analyzed the immune response to modified Env candidates expressed in plasmids with modified codons to improve gene expression. Both antibody and CTL responses were analyzed after injection of plasmid DNA into muscle. A modified gp140 DNA with improved ability to elicit antibody and CTL responses to HIV Env has now been identified that is envisioned as a prototype immunogen that can elicit broadly neutralizing antibody responses to HIV.

Exposing the Core Protein of Viral Membrane Fusion Proteins

Described herein are modified HIV envelope proteins that improve the immune response to native gp160 and expose the core protein for optimal antigen presentation and recognition. Weissenhorn et al., Molecular Cell, 2, 605-616, 1998 proposes a core protein as a model for a fusion intermediate of viral glycoproteins, where the glycoproteins are characterized by a central triple stranded coiled coil followed by a disulfide-bonded loop that reverses the chain direction and connects to an α helix packed antiparallel to the core helices, as, for example, in the case of Ebola Zaire GP2, Murine Moloney Leukemia virus (MuMoLv) 55-residue segment of the TM subunit (Mo-55), low-pH-treated influenza HA2, protease resistant core of HIV gp41, and SIV gp41 (Figure A). Thus, the strategy for improving the immune response by exposing the protease resistant core of HIV gp41 extends to other viral membrane fusion proteins that are characterized by a central triple stranded coiled coil followed by a disulfide-bonded loop that reverses the chain direction and connects to an α helix packed antiparallel to the core helices.

The present approach involves a series of internal mutations designed to replace the cleavage site (C), the fusion domain (F), and the interspace (I) between the two heptad repeats all on a backbone of COOH-terminal truncations to expose the core protein of the viral membrane fusion protein Env, based on modified gp140 as a prototype immunogen. By replacement is meant deletions, insertions, and/or substitutions of amino acid residues. In one embodiment, deletions are meant (i.e., amino acids are deleted to create the ΔCFI mutations).

In this embodiment, the ΔC mutation is intended to eliminate proteolysis by deleting the gp120/gp41 cleavage site that links the envelope covalently to the ectodomain by 100%, 99%, 98%, 97%, 96%, 95%, 94%, 93%, 92%, 91%, 90%, 89%, 88%, 87%, 86%, 85%, 84%, 83%, 82%, 81,%, 80%, 79%, 78%, 77%, 76%, 75%, 74%, 73,%, 72%, 71%, 70%, 69%, 68%, 67%, 66%, 65%, 64%, 63%, 62%, 61%, 60%, 59%, 58%, 57%, 56%, 55%, 54%, 53%, 52%, 51%, 50%, 49%, 48%, 47%, 46%, 45%, 44%, 43%, 42, 41%, 40%, 39%, 38%, 37%, 36%, 35%, 34%, 33%, 32%, 31%, 30%, 29%, 28%, 27%, 26%, 25%, 24%, 23%, 22%, 21%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%,11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, or 1%.

In this embodiment, the ΔF mutation is intended to solubilize the molecule by deleting the fusion domain by 100%, 99%, 98%, 97%, 96%, 95%, 94%, 93%,

92%, 91%, 90%, 89%, 88%, 87%, 86%, 85%, 84%, 83%, 82%, 81,%, 80%, 79%, 78%, 77%, 76%, 75%, 74%, 73,%, 72%, 71%, 70%, 69%, 68%, 67%, 66%, 65%, 64%, 63%, 62%, 61%, 60%, 59%, 58%, 57%, 56%, 55%, 54%, 53%, 52%, 51%, 50%, 49%, 48%, 47%, 46%, 45%, 44%, 43%, 42, 41%, 40%, 39%, 38%, 37%, 36%, 35%, 34%, 33%, 32%, 31%, 30%, 29%, 28%, 27%, 26%, 25%, 24%, 23%, 22%, 21%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%,11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, or 1%.

In this embodiment, the ΔI mutation is intended to stabilize oligomer formation by deleting the interspace between the two heptad repeats by 100%, 99%, 98%, 97%, 96%, 95%, 94%, 93%, 92%, 91%, 90%, 89%, 88%, 87%, 86%, 85%, 84%, 83%, 82%, 81,%, 80%, 79%, 78%, 77%, 76%, 75%, 74%, 73,%, 72%, 71%, 70%, 69%, 68%, 67%, 66%, 65%, 64%, 63%, 62%, 61%, 60%, 59%, 58%, 57%, 56%, 55%, 54%, 53%, 52%, 51%, 50%, 49%, 48%, 47%, 46%, 45%, 44%, 43%, 42, 41%, 40%, 39%, 38%, 37%, 36%, 35%, 34%, 33%, 32%, 31%, 30%, 29%, 28%, 27%, 26%, 25%, 24%, 23%, 22%, 21%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%,11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, or 1%.

In this embodiment, the COOH-terminal truncation is intended to reduce toxicity by deleting the cytoplasmic domain by 100%, 99%, 98%, 97%, 96%, 95%, 94%, 93%, 92%, 91%, 90%, 89%, 88%, 87%, 86%, 85%, 84%, 83%, 82%, 81,%, 80%, 79%, 78%, 77%, 76%, 75%, 74%, 73,%, 72%, 71%, 70%, 69%, 68%, 67%, 66%, 65%, 64%, 63%, 62%, 61%, 60%, 59%, 58%, 57%, 56%, 55%, 54%, 53%, 52%, 51%, 50%, 49%, 48%, 47%, 46%, 45%, 44%, 43%, 42, 41%, 40%, 39%, 38%, 37%, 36%, 35%, 34%, 33%, 32%, 31%, 30%, 29%, 28%, 27%, 26%, 25%, 24%, 23%, 22%, 21%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%,11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, or 1%.

In this embodiment, optionally, the COOH-terminal truncation is extended so as to solubilize the molecule by deleting the transmembrane domain by 100% 99%, 98%, 97%, 96%, 95%, 94%, 93%, 92%, 91%, 90%, 89%, 88%, 87%, 86%, 85%, 84%, 83%, 82%, 81,%, 80%, 79%, 78%, 77%, 76%, 75%, 74%, 73,%, 72%, 71%, 70%, 69%, 68%, 67%, 66%, 65%, 64%, 63%, 62%, 61%, 60%, 59%, 58%, 57%, 56%, 55%, 54%, 53%, 52%, 51%, 50%, 49%, 48%, 47%, 46%, 45%, 44%, 43%, 42, 41%, 40%, 39%, 38%, 37%, 36%, 35%, 34%, 33%, 32%, 31%, 30%, 29%, 28%, 27%, 26%, 25%, 24%, 23%, 22%, 21%, 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%,11%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, or 1%.

Amino acid substitutions may encompass those of a conserved or non-conserved nature. Presumably, a non-conserved substitution of a domain would act like a deletion of the domain. Conserved amino acid substitutions constitute switching one or more amino acids with amino acids of similar charge, size, and/or hydrophobicity characteristics. Non-conserved amino acid substitutions constitute switching one or more amino acids with amino acids of dissimilar charge, size, and/or hydrophobicity characteristics. The families of amino acids include the basic amino acids (lysine, arginine, histidine); the acidic amino acids (aspartic acid, glutamic acid); the non-polar amino acids (alanine, valine, leucine, isoleucine, proline, phenylalanine, methionine, tryptophan); the uncharged polar amino acids (glycine, asparagine, glutamine, cysteine, serine, threonine, tyrosine); and the aromatic amino acids (phenylalanine, tryptophan, and tyrosine). One or more substitutions may be introduced to achieve the ΔC mutation intended to eliminate proteolysis by acting like a deletion of the gp120/gp41 cleavage site to link the envelope covalently to the ectodomain, the ΔF mutation intended to solubilize the molecule by acting like a deletion of the fusion domain, the ΔI mutation intended to stabilize oligomer formation by acting like a deletion of the interspace between the two heptad repeats, the COOH-terminal truncation intended to reduce toxicity by acting like a deletion of the cytoplasmic domain, and, optionally, the COOH-terminal truncation extended so as to solubilize the molecule by acting like a deletion of the transmembrane domain.

Amino acid insertions may constitute single amino acid residues or stretches of residues. The insertions may be made at the carboxy or amino terminal end of a domain, as well as at a position internal to the domain. Such insertions will generally range from 2 to 15 amino acids in length. One or more insertions may be introduced to achieve the ΔC mutation intended to eliminate proteolysis by acting like a deletion of the gp120/gp41 cleavage site to link the envelope covalently to the ectodomain, the ΔF mutation intended to solubilize the molecule by acting like a deletion of the fusion domain, the ΔI mutation intended to stabilize oligomer formation by acting like a deletion the interspace between the two heptad repeats, the COOH-terminal truncation intended to reduce toxicity by acting like a deletion of the cytoplasmic domain, and, optionally, the COOH-terminal truncation extended so as to solubilize the molecule by acting like a deletion of the transmembrane domain.

The nucleic acids of the present invention are optionally DNA, RNA, or mRNA. Most typically, the nucleic acids are provided by recombinantly making a DNA, which is expressed in a cell as RNA and/or as mRNA. Given the strategy for making the nucleic acids of the present invention, one of skill can construct a variety of clones containing functionally equivalent nucleic acids. Cloning methodologies to accomplish these ends, and sequencing methods to verify the sequence of nucleic acids are well known in the art. Examples of appropriate cloning and sequencing techniques, and instructions sufficient to direct persons of skill through many cloning exercises are found in Berger and Kimmel, Guide to Molecular Cloning Techniques, Methods in Enzymology, volume 152, Academic Press, Inc., San Diego, Calif. (Berger); Sambrook, et al. (1989) Molecular Cloning--A Laboratory Manual (2nd ed.) Vol. 1-3, Cold Spring Harbor Laboratory, Cold Spring Harbor Press, N.Y., (Sambrook); and Current Protocols in Molecular Biology, F. M. Ausubel, et al., eds., Current Protocols, a joint venture between Greene Publishing Associates, Inc. and John Wiley & Sons, Inc., (1994 Supplement) (Ausubel). Product information from manufacturers of biological reagents and experimental equipment also provide information useful in known biological methods. Such manufacturers include the SIGMA chemical company (Saint Louis, Mo.), R&D systems (Minneapolis, Minn.), Pharmacia LKB Biotechnology (Piscataway, N.J.), CLONTECH Laboratories, Inc. (Palo Alto, Calif.), Chem Genes Corp., Aldrich Chemical Company (Milwaukee, Wis.), Glen Research, Inc., GIBCO BRL Life Technologies, Inc. (Gaithersberg, Md.), Fluka Chemica-Biochemika Analytika (Fluka Chemie AG, Buchs, Switzerland), Invitrogen, San Diego, Calif., and Applied Biosystems (Foster City, Calif.), as well as many other commercial sources known to one of skill.

The nucleic acid compositions of this invention, whether RNA, cDNA, mRNA, genomic DNA, or a hybrid of the various combinations, are isolated from biological sources or synthesized in vitro. The nucleic acids of the present invention are present in transformed or transfected whole cells, in transformed or transfected cell lysates, or in a partially purified or substantially pure form.

In vitro amplification techniques suitable for amplifying sequences to provide a nucleic acid or for subsequent analysis, sequencing or subcloning are known. Examples of techniques sufficient to direct persons of skill through such in vitro amplification methods, including the polymerase chain reaction (PCR) the

ligase chain reaction (LCR), Qβ-replicase amplification and other RNA polymerase mediated techniques (e.g., NASBA) are found in Berger, Sambrook, and Ausubel, as well as Mullis, et al., (1987) U.S. Pat. No. 4,683,202; PCR Protocols A Guide to Methods and Applications (Innis, et al. eds) Academic Press Inc. San Diego, Calif. (1990) (Innis); Arnheim & Levinson (Oct. 1, 1990) C&EN 36-47; The Journal Of NIH Research (1991) 3:81-94; Kwoh, et al., Proc. Natl. Acad. Sci. USA, 86:1173 (1989); Guatelli, et al., Proc. Natl. Acad. Sci. USA, 87:1874 (1990); Lomell, et al., J. Clin. Chem., 35:1826 (1989); Landegren, et al., Science, 241:1077-1080 (1988); Van Brunt, Biotechnology, 8:291-294 (1990); Wu and Wallace, Gene, 4:560 (1989); Barringer, et al., Gene, 89:117 (1990), and Sooknanan and Malek, Biotechnology, 13:563-564 (1995). Improved methods of cloning in vitro amplified nucleic acids are described in Wallace, et al., U.S. Pat. No. 5,426,039. Improved methods of amplifying large nucleic acids (up to 40 kb) are summarized in Cheng, et al., Nature, 369:684-685 (1994) and the references therein. One of skill will appreciate that essentially any RNA can be converted into a double stranded DNA suitable for restriction digestion, PCR expansion and sequencing using reverse transcriptase and a polymerase. See, Ausubel, Sambrook, Innis, and Berger, all supra.

One of skill will recognize many ways of generating alterations in a given nucleic acid construct. Such well-known methods include site-directed mutagenesis, PCR amplification using degenerate oligonucleotides, exposure of cells containing the nucleic acid to mutagenic agents or radiation, chemical synthesis of a desired oligonucleotide (e.g., in conjunction with ligation and/or cloning to generate large nucleic acids) and other well-known techniques. See, Giliman and Smith, Gene 8:81-97 (1979), Roberts, et al., Nature, 328:731-734 (1987) and Sambrook, Innis, Ausubel, Berger, and Mullis (all supra).

Most modifications to nucleic acids are evaluated by routine screening techniques in suitable assays for the desired characteristic. For instance, changes in the immunological character of encoded polypeptides can be detected by an appropriate immunological assay. For instance, changes in the cellular immunological character of the polypeptide can be detected by an appropriate antibody or CTL assay. Modifications of other properties such as nucleic acid hybridization to a complementary nucleic acid, redox or thermal stability of encoded proteins, hydrophobicity, susceptibility to proteolysis, or the tendency to aggregate are all assayed according to standard techniques.

A wide variety of formats and labels are available and appropriate for detection of polypeptide sequences. These include analytic biochemical methods such as spectrophotometry, radiography, electrophoresis, capillary electrophoresis, high performance liquid chromatography (HPLC), thin layer chromatography (TLC), hyperdiffusion chromatography, and the like, and various immunological methods such as fluid or gel precipitin reactions, immunodiffusion (single or double), immunoelectrophoresis, radioimmunoassays (RIAs), enzyme-linked immunosorbent assays (ELISAs), western blot assays, immunofluorescent assays, and the like. Several commercially available ELISA assays for the detection of retroviral components, including Env domains, are available, allowing one of skill to detect Env in biological samples.

Similarly, the detection of the nucleic acids of the present invention proceeds by well known methods such as Southern analysis, northern analysis, gel electrophoresis, PCR, radiolabeling and scintillation counting, and affinity chromatography. Many assay formats are appropriate, including those reviewed in Tijssen (1993) Laboratory Techniques in biochemistry and molecular biology--hybridization with nucleic acid probes parts I and II, Elsevier, New York and Choo (ed) (1994) Methods In Molecular Biology Volume 33--In Situ Hybridization Protocols, Humana Press Inc., New Jersey (see also, other books in the Methods in Molecular Biology series); see especially, Chapter 21 of Choo (id.) "Detection of Virus Nucleic Acids by Radioactive and Nonisotopic in Situ Hybridization". Finally, PCR is also routinely used to detect nucleic acids in biological samples (see, Innis, supra, for a general description of PCR techniques).

In one preferred embodiment, antibodies are used to detect polypeptide sequences. Methods of producing polyclonal and monoclonal antibodies are known to those of skill in the art, and many anti-HIV antibodies are available. See, e.g., Coligan (1991) Current Protocols in Immunology, Wiley/Greene, NY; and Harlow and Lane (1989) Antibodies: A Laboratory Manual, Cold Spring Harbor Press, NY; Stites, et al. (eds.) Basic and Clinical Immunology (4th ed.), Lange Medical Publications, Los Altos, Calif., and references cited therein; Goding (1986) Monoclonal Antibodies: Principles and Practice (2d ed.), Academic Press, New York, N.Y.; and Kohler and Milstein, Nature, 256:495-497 (1975). Other suitable techniques for antibody preparation include selection of libraries of recombinant antibodies in phage or similar vectors. See, Huse, et al., Science, 246:1275-1281 (1989); and Ward, et al., Nature, 341:544-546 (1989). Specific monoclonal and

polyclonal antibodies and antisera will usually bind with a KD of at least about 0.1 mM, more usually at least about 1 μM, preferably at least about 0.1 μM or better, and most typically and preferably, 0.01 μM or better.

Development of HIV Env Vectors

To develop Env glycoprotein variants that might effectively induce humoral and cellular immunity, a series of plasmid expression vectors were generated (Fig. I). HIV Env is encoded by nucleic acid sequences that contain RNA structures that limit gene expression (Andre S et al, 1998, J Virol, 72:1497-503; Qiu JT et al., 1999, J Virol, 73:9145-52; Rana TM et al., 1999, Arch Biochem Biophys, 365:175-85; Roebuck KA, Saifuddin M, 1999, Gene Expr, 8:67-84; Romano G, et al., 1999, J Cell Biochem, 75:357-68; Schneider R et al., 1997, J Virol, 71:4892-903). These vectors were therefore synthesized using codons found in human genes that allow these structures to be eliminated without affecting the amino acid sequence. Full-length HIV Env (gp160) was highly expressed in the absence of HIV accessory proteins at levels ≥10-fold higher than Rev-dependent viral gp 160 in transfected 293 cell by Western blot analysis (Fig. IIA), and the relevant mutant proteins were detected at the expected apparent molecular weights (Fig. IIC-D). As might be anticipated, gp160 expressed from the synthetic gene was not efficiently processed in transfected 293 cells, presumably because over-expression of gp160 saturates the cellular proteases responsible for cleavage. (Binley JM et al., 2000, J. Virol, 74:627-643.) Synthetic HIV gp160 induced toxicity in transfected cells, with cell rounding and detachment evident within 48 hours (Fig. IIIA vs B). This cytotoxicity was reduced by elimination of the COOH-terminal cytoplasmic domain. Env protein that terminated at amino acid 752 (gp150) was less cytotoxic than gp160, while the shorter proteins (gp145 and gp140) produced little or no effect (Fig. IIIC, D, and E, respectively).

To alter Env immunogenicity, two different approaches were explored. First the effects of glycosylation on cellular and humoral immunity were evaluated by analysis of mutants in which conserved N-linked glycosylation sites were eliminated by site-directed mutagenesis. Two sets of mutations were introduced into both gp160 and gp150 (Fig. I). The first set included eleven potential sites (Δgly11), and the second set included an additional 6 sites downstream (Δgly17). Expression studies showed that the glycosylation mutants were efficiently expressed, and the

glycosylation mutant protein was appropriately reduced in size compared to wild type gp160 or gp150, consistent with reduced N-linked glycosylation (Fig IIC).

The second approach involved a series of internal deletions designed to stabilize and expose functional domains of the protein that might be present in an extended helical structure prior to the formation of the six-member coiled-coil structure in the hairpin intermediate (Chan DC et al., 1997, Cell, 89:263-73; Weissenhorn W et al., 1997, Nature, 387:426-30). To generate this putative pre-hairpin structure, the cleavage site was removed to prevent the proteolytic processing of the envelope and stabilize the protein by linking it covalently to the gp41 extracellular and/or transmembrane domain. To reduce toxicity and enhance stability, the fusion peptide domain was deleted. The heptad repeats in the envelope protein are important tertiary structure domains involved in the ability of the envelope protein to form trimers (Lu M, Kim PS, 1997, J Biomol Struct Dyn, 15:465-71). The sequence between the heptad repeats was removed to stabilize the formation of trimers and eliminate formation of the hairpin intermediate. These ΔCFI deletions were introduced into full-length gp160 and COOH-terminal truncation mutants. Though cells trasfected with vectors encoding gp140ΔCFI, gp145ΔCFI and gp160 readily expressed these proteins (Fig. IID), only gp140ΔCFI, which lacks the transmembrane domain, was readily detected in the supernatant (Fig. IV), indicating that it can give rise to soluble antigen.

Immunogenicity of Env Mutants After DNA Vaccination

The ability of these Env proteins to elicit an immune response was determined in mice by injection with these plasmid DNA expression vectors. Antibody responses were monitored by the ability of antisera from injected mice to immunoprecipitate wild type gp160 from cell lysates by SDS-PAGE and Western blotting (Fig. V). In some cases, antibody reactivity was also confirmed by immunofluorescence. To quantitate the antibody response, immunoprecipitation followed by Western blotting with different dilutions of immunized mouse sera was tested. The intensity of the gp160 band was determined by densitometry and standardized relative to a positive control sera used to normalize data between experiments. The approximately linear dose response of gp160 intensity with serum dilution allowed quantification of the anti-gp160 antibody response in mouse sera. Data from immunized mice showed that none of the wild type Env proteins, neither the gp160, gp150, gp145, nor gp140 COOH-terminal truncations generated

consistently high antibody responses (Fig. VA). Of these proteins, gp140 was somewhat more effective than gp160 in generating antibody responses but remained low and inconsistent. Immunization with vectors designed to express glycosylation deficient envelope proteins also did not improve the humoral response. In contrast, the ΔCFI mutants in the Env truncation vectors substantially increased anti-gp160 antibody response (Fig. VA; gp145, gp140, and gp128). The longer ΔCFI Env proteins (gp160 and gp150) did not show comparable enhancement of this response. The gp140 (ΔCFI) provided more consistent and a greater increase in antibody response than gp128ΔCFI (Fig VB). In all cases, these vectors that encoded gp140ΔCFI, but not wild type gp140, induced antibodies that were reactive to native gp160 (Fig. VC).

To determine whether these modifications of Env adversely affected CTL responses, spleen cells from immunized mice were tested for their ability to lyse relevant target cells. All mice immunized with codon-altered Env vectors, including COOH-terminal deletion mutations (Fig. VIA) or glycosylation mutants (Fig. VIB), elicited strong CTL responses directed to cell lines pulsed with HIV Env peptides. These findings were also confirmed using stably transfected cells that expressed Env. Importantly, gp140 (ΔCFI), which elicited increased antibody responses relative to the comparable wild typ Env, readily induced CTL responses to native Env, as did other ΔCFI mutants (Fig. VIC). Addition of anti-CD8 antibody inhibited cytolytic activity, as did depletion using magnetic beads coupled with anti-CD8 antibody, thus confirming a cytotoxic T cell response to these immunogens after genetic immunization (Fig. VID). This response was detectable for at least six months after immunization.

Glycosylation and ΔCFI HIV Env Mutants

To develop DNA vaccine candidates for HIV, we developed a series of synthetic genes designed to express HIV Env mutants in human cells. In the absence of HIV regulatory proteins, these codon-altered envelope protein genes expressed well in human cells. Like other DNA vaccines, immunization with these vectors elicited strong CTL responses in mice, and antibody responses were not robust in mice immunized with wild type Env expression vectors. Mutations in highly conserved N-linked glycosylation sites did not significantly alter humoral or cellular immune response to native Env. In contrast, a mutant Env with deletions in the cleavage site, fusion domain, and a region between the heptad repeats elicited a

more potent humoral immune response and retained its ability to stimulate Env-specific CTL.

Recent reports suggest that gp160 forms trimers *in vivo* and the domain required for trimer formation resides in the ectodomain of the gp41 (Yang X et al., 2000, J Virol, 74:5716-25). Such trimeric forms of HIV envelope protein are likely to present different epitopes to the immune system compared to monomeric gp120. In addition to the linear epitopes in the envelope, this trimeric structure is likely to expose conformational epitopes important for B cell triggering of a relevant antibody response. In this regard, gp140 (ΔCFI), which induced the greatest antibody response, is released in a soluble form (Fig. IVB). In contrast, wild type Env did not elicit high titer antibody responses. The toxicity of Env in mammalian cells has been seen and could limit both the amount and duration of envelope protein expression *in vivo* that would affect immunogenicity. The envelope is also heavily glycosylated, and removal of partial or complete gp120 glycosylation sites has resulted in higher titers of strain-specific neutralizing antibody responses to mutant SIVs in monkeys (Binley JM et al., 1998, AIDS Res Hum Retroviruses, **14** :191-8; Reitter JN et al., 1998, Nat Med, 4:679-84). Though it seemed reasonable that deglycosylation would reveal epitopes otherwise masked in the native protein, we did not observe enhanced immune reactivity by DNA vaccination using different glycosylation site mutants, both in gp160 and gp150. This difference with the previous study is likely due to the fact that DNA vaccination rather than viral infection was utilized for immunization. Though glycosylation mutants are unlikely to prove helpful with this former method of immunization, we envision that modification of glycosylation sites will be effective with other vectors or adjuvants.

HIV-1 Env is proteolytically cleaved by a cellular convertase into gp120 and gp41 (Eckert DM et al., 1999, Cell, 99:103-15). The gp41 subunit is composed of cytoplasmic, transmembrane, and ectodomain segments. The role of the ectodomain of the envelope in membrane fusion, particularly its hydrophobic glycine-rich fusion peptide, is well established. Two regions with heptad coiled-coil repeats in the ectodomain of gp41 are involved in viral fusion (Eckert DM et al., 1999, Cell, 99:103-15; Weissenhorn W et al., 1996, EMBO J, 15:1507-14). Upon fusion, these two alpha helices, connected via a disulfide-stabilized loop (Gallaher WR et al., 1989, AIDS Res Hum Retroviruses, 5:431-40; Kent KA, Robinson J, 1996, AIDS, **10 Suppl A**:S107-S114; Sattentau QJ et al., 1995, Virology, **206**:713-7), presumably

undergo a transient conformational change to a fusion active state. These changes allow the formation of a six-member helical hairpin intermediate structure that presumably exposes the fusion peptide at the NH_2-terminus of gp41, allowing fusion to the target cell membrane (Binley J, Moore JP,[published erratum appears in Nature 1997 Sep 11;389(6647):131], 1997, Nature, **387** :346-8; LaCasse R et al., 1999, Science, **283**:357-62). The ΔCFI mutation was intended to eliminate cleavage of gp140, remove the unstable hydrophobic region and stabilize oligomer formation. Though detailed structural data is not yet available on this protein, these mutations apparently stabilize Env in a conformation that elicits both humoral and cellular immune responses. For example, the neutralizing epitope in the ectodomain of gp41 (Muster T et al., 1994, J Virol, **68**:4031-4) is present in the series of deletions and truncations of the envelope and gp140 (ΔCFI) is reactive with the 2F5 neutralizing monoclonal antibody that binds to this epitope. Importantly, these immunogens also induced CTL responses to Env. Though gp128 (ΔCFI) induced slightly more potent CTL activity, gp140 (ΔCFI) was better able to elicit such responses, both to peptide-pulsed cells and stably transduced target cells. Thus the enhanced humoral immune response introduced by this vaccine candidate did not appear to diminish the CTL response. Taken together, these results indicate that gp140ΔCFI serves as an improved immunogen that can more effectively elicit an antibody response against the envelope by DNA vaccination while preserving its ability to induce a CTL response.

Gag and Pol

In this disclosure, we have prepared synthetic HIV-1 B clade Gag and Pol expression vectors that are based on human (h) codon usage. These vectors encode hGag-Pol and its derivatives, hGag, hPol and an hGag-Pol fusion protein. The synthetic Gag-Pol genes show little nucleotide homology to HIV-1 but are the same in protein sequence. The modified Gag-Pol genes were subcloned into a eukaryotic plasmid expression vector for expression and DNA immunization studies. Synthetic Gag-Pol genes allowed high level Rev-independent expression of HIV-1 Gag-Pol precursor proteins in human and mouse cell lines and induced significant cellular and humoral responses in mice. The Gag-Pol fusion protein induced the broadest responses to Gag and Pol determinants and thus is envisioned as a prototype immunogen that maximizes epitope presentation.

Eliminating The Frame Shift Site To Create Viral Polyproteins

Described herein are HIV Gag-Pol fusion proteins encoded by a continuous open reading frame so to improve the immune response to native Gag and Pol. In some viruses, translational frame shifting is exploited during protein synthesis. Specific sequences in the RNA are required for the frame shifting. The viral RNA sequences cause ribosomal slippage so that viral proteins are produced in non-equivalent ratios. For example, during translation in HIV, the ribosomes shift reading frames to synthesize Gag precursor protein and the gag-pol fusion protein in a 20:1 ratio. The strategy here is to maximize epitope presentation by transcribing an immunogen from a continuous open reading frame by eliminating the frame shift site. Thus, the strategy for improving the immune response by the use of a HIV Gag-Pol fusion protein encoded by a continuous open reading frame extends to other viral proteins that are produced in non-equivalent ratios by virtue of translational frame shifting.

The present invention involves HIV Gag-Pol fusion proteins encoded by a single continuous open reading frame due to mutation of the frame shift site. The frame shift site is mutated by deletions, insertions, and/or substitutions of nucleotides to create a single continuous open reading frame. In one embodiment, deletions are meant (i.e., nucleotides are deleted to create the same open reading frame).

The frame shift site is a mutated frame shift to create a single continuous open reading frame. For example, a set of similar retroviral gag-pol frame shift sites are optionally made for a given fusion protein, for example, by synthesizing different gag-pol frame shift regions and cloning the sequences appropriately, or by site-directed mutagenesis of a given frame shift clone. The efficacy of the frame shift sites are assessed by measuring the production of the fusion protein. The sequence that shows the highest level of expression is a "optimized" frame shift mutation for the set assessed. Alternatively, where a particular level of expression is desired, a frame shift site from a particular set of possible frame shift sites which is closest to the desired activity level is considered to be "optimized."

Although a full length Gag sequence is preferred for use in the fusion protein of the present invention, Gag is optionally deleted of subsequences without negating a polyepitope response. For example, regions of the matrix protein (p17), regions of the capsid protein (p24), regions of p2, regions of the nucleocapsid protein (p7), regions of p1, and regions of p6 can be deleted while preserving the polyepitope

response. Alternatively, regions of the matrix protein (p17), regions of the capsid protein (p24), regions of p2, regions of the nucleocapsid protein (p7), regions of p1, and regions of p6 can be substituted while preserving the polyepitope response . Alternatively, regions of the matrix protein (p17), regions of the capsid protein (p24), regions of p2, regions of the nucleocapsid protein (p7), regions of p1, and regions of p6 can be interrupted by insertions while preserving the polyepitope response. Optionally, regions of the matrix protein (p17), regions of the capsid protein (p24), regions of p2, regions of the nucleocapsid protein (p7), regions of p1, and regions of p6 can be mutated to inactivate these proteins.

Likewise, a full length Pol sequence is preferred for use in the fusion protein of the present invention, and Pol is optionally deleted of subsequences without negating a polyepitope response. For example, regions of the protease protein, regions of the reverse transcriptase protein, and regions of the integrase protein can be deleted while preserving the polyepitope response. Alternatively, regions of the protease protein, regions of the reverse transcriptase protein, and regions of the integrase protein can be substituted while preserving the polyepitope response. Alternatively, regions of the protease protein, regions of the reverse transcriptase protein, and regions of the integrase protein can be interrupted by insertions while preserving the polyepitope response. Optionally, regions of the protease protein, regions of the reverse transcriptase protein, and regions of the integrase protein can be mutated to inactivate these enzymes.

In other embodiments, the Gag-Pol fusion proteins are co-expressed with other proteins, either as fusion proteins or separately, preferably with Env sequence proteins, such as the modified HIV Env ΔCFI proteins described herein.

In another aspect, the invention involves chimeric nucleic acid molecules. The chimeric nucleic acid molecules of the invention typically have a retroviral gag nucleic acid sequence and a retroviral pol nucleic acid sequence in the same open reading frame due to mutation of the frame shift site. The continuous open reading frame encodes a fusion protein such as those described above.

The chimeric nucleic acids of the present invention are optionally DNA, RNA, or mRNA. Most typically, the chimeric nucleic acids are provided by recombinantly making a DNA, which is expressed in a cell as RNA and/or as mRNA. Given the strategy for making the chimeric nucleic acids of the present invention, one of skill can construct a variety of clones containing functionally

equivalent nucleic acids. Cloning methodologies to accomplish these ends, and sequencing methods to verify the sequence of nucleic acids are well known in the art. Examples of appropriate cloning and sequencing techniques, and instructions sufficient to direct persons of skill through many cloning exercises are found in Berger and Kimmel, Guide to Molecular Cloning Techniques, Methods in Enzymology, volume 152, Academic Press, Inc., San Diego, Calif. (Berger); Sambrook, et al. (1989) Molecular Cloning--A Laboratory Manual (2nd ed.) Vol. 1-3, Cold Spring Harbor Laboratory, Cold Spring Harbor Press, N.Y., (Sambrook); and Current Protocols in Molecular Biology, F. M. Ausubel, et al., eds., Current Protocols, a joint venture between Greene Publishing Associates, Inc. and John Wiley & Sons, Inc., (1994 Supplement) (Ausubel). Product information from manufacturers of biological reagents and experimental equipment also provide information useful in known biological methods. Such manufacturers include the SIGMA chemical company (Saint Louis, Mo.), R&D systems (Minneapolis, Minn.), Pharmacia LKB Biotechnology (Piscataway, N.J.), CLONTECH Laboratories, Inc. (Palo Alto, Calif.), Chem Genes Corp., Aldrich Chemical Company (Milwaukee, Wis.), Glen Research, Inc., GIBCO BRL Life Technologies, Inc. (Gaithersberg, Md.), Fluka Chemica-Biochemika Analytika (Fluka Chemie AG, Buchs, Switzerland), Invitrogen, San Diego, Calif., and Applied Biosystems (Foster City, Calif.), as well as many other commercial sources known to one of skill.

The chimeric nucleic acid compositions of this invention, whether RNA, cDNA, mRNA, genomic DNA, or a hybrid of the various combinations, are isolated from biological sources or synthesized in vitro. The chimeric nucleic acids of the present invention are present in transformed or transfected whole cells, in transformed or transfected cell lysates, or in a partially purified or substantially pure form.

In vitro amplification techniques suitable for amplifying sequences to provide a nucleic acid or for subsequent analysis, sequencing or subcloning are known. Examples of techniques sufficient to direct persons of skill through such in vitro amplification methods, including the polymerase chain reaction (PCR) the ligase chain reaction (LCR), Qβ-replicase amplification and other RNA polymerase mediated techniques (e.g., NASBA) are found in Berger, Sambrook, and Ausubel, as well as Mullis, et al., (1987) U.S. Pat. No. 4,683,202; PCR Protocols A Guide to Methods and Applications (Innis, et al. eds) Academic Press Inc. San Diego, Calif.

(1990) (Innis); Arnheim & Levinson (Oct. 1, 1990) C&EN 36-47; The Journal Of NIH Research (1991) 3:81-94; Kwoh, et al., Proc. Natl. Acad. Sci. USA, 86:1173 (1989); Guatelli, et al., Proc. Natl. Acad. Sci. USA, 87:1874 (1990); Lomell, et al., J. Clin. Chem., 35:1826 (1989); Landegren, et al., Science, 241:1077-1080 (1988); Van Brunt, Biotechnology, 8:291-294 (1990); Wu and Wallace, Gene, 4:560 (1989); Barringer, et al., Gene, 89:117 (1990), and Sooknanan and Malek, Biotechnology, 13:563-564 (1995). Improved methods of cloning in vitro amplified nucleic acids are described in Wallace, et al., U.S. Pat. No. 5,426,039. Improved methods of amplifying large nucleic acids (up to 40 kb) are summarized in Cheng, et al., Nature, 369:684-685 (1994) and the references therein. One of skill will appreciate that essentially any RNA can be converted into a double stranded DNA suitable for restriction digestion, PCR expansion and sequencing using reverse transcriptase and a polymerase. See, Ausubel, Sambrook, Innis, and Berger, all supra.

One of skill will recognize many ways of generating alterations in a given nucleic acid construct. Such well-known methods include site-directed mutagenesis, PCR amplification using degenerate oligonucleotides, exposure of cells containing the nucleic acid to mutagenic agents or radiation, chemical synthesis of a desired oligonucleotide (e.g., in conjunction with ligation and/or cloning to generate large nucleic acids) and other well-known techniques. See, Giliman and Smith, Gene 8:81-97 (1979), Roberts, et al., Nature, 328:731-734 (1987) and Sambrook, Innis, Ausubel, Berger, and Mullis (all supra).

Most modifications to nucleic acids are evaluated by routine screening techniques in suitable assays for the desired characteristic. For instance, changes in the immunological character of encoded polypeptides can be detected by an appropriate immunological assay. For instance, changes in the cellular immunological character of the polypeptide can be detected by an appropriate antibody or CTL assay. Modifications of other properties such as nucleic acid hybridization to a complementary nucleic acid, redox or thermal stability of encoded proteins, hydrophobicity, susceptibility to proteolysis, or the tendency to aggregate are all assayed according to standard techniques.

A wide variety of formats and labels are available and appropriate for detection of fusion protein sequences. These include analytic biochemical methods such as spectrophotometry, radiography, electrophoresis, capillary electrophoresis, high performance liquid chromatography (HPLC), thin layer chromatography (TLC), hyperdiffusion chromatography, and the like, and various immunological

methods such as fluid or gel precipitin reactions, immunodiffusion (single or double), immunoelectrophoresis, radioimmunoassays (RIAs), enzyme-linked immunosorbent assays (ELISAs), western blot assays, immunofluorescent assays, and the like. Several commercially available ELISA assays for the detection of retroviral components, including Env domains, are available, allowing one of skill to detect Env in biological samples.

Similarly, the detection of the chimeric nucleic acids of the present invention proceeds by well known methods such as Southern analysis, northern analysis, gel electrophoresis, PCR, radiolabeling and scintillation counting, and affinity chromatography. Many assay formats are appropriate, including those reviewed in Tijssen (1993) Laboratory Techniques in biochemistry and molecular biology--hybridization with nucleic acid probes parts I and II, Elsevier, New York and Choo (ed) (1994) Methods In Molecular Biology Volume 33--In Situ Hybridization Protocols, Humana Press Inc., New Jersey (see also, other books in the Methods in Molecular Biology series); see especially, Chapter 21 of Choo (id.) "Detection of Virus Nucleic Acids by Radioactive and Nonisotopic in Situ Hybridization". Finally, PCR is also routinely used to detect nucleic acids in biological samples (see, Innis, supra, for a general description of PCR techniques).

In one preferred embodiment, antibodies are used to detect polypeptide sequences. Methods of producing polyclonal and monoclonal antibodies are known to those of skill in the art, and many anti-HIV antibodies are available. See, e.g., Coligan (1991) Current Protocols in Immunology, Wiley/Greene, NY; and Harlow and Lane (1989) Antibodies: A Laboratory Manual, Cold Spring Harbor Press, NY; Stites, et al. (eds.) Basic and Clinical Immunology (4th ed.), Lange Medical Publications, Los Altos, Calif., and references cited therein; Goding (1986) Monoclonal Antibodies: Principles and Practice (2d ed.), Academic Press, New York, N.Y.; and Kohler and Milstein, Nature, 256:495-497 (1975). Other suitable techniques for antibody preparation include selection of libraries of recombinant antibodies in phage or similar vectors. See, Huse, et al., Science, 246:1275-1281 (1989); and Ward, et al., Nature, 341:544-546 (1989). Specific monoclonal and polyclonal antibodies and antisera will usually bind with a KD of at least about 0.1 mM, more usually at least about 1 μM, preferably at least about 0.1 μM or better, and most typically and preferably, 0.01 μM or better.

Expression of Synthetic HIV-1 Gag and Pol Genes

Four synthetic HIV-1 Gag-and/or Pol expression vectors, hGag-Pol, hGag-PolΔFsΔPr, hPol and hGag genes were prepared (Fig. VII). To confirm expression, the synthetic or viral Gag-Pol genes were transiently transfected into 293T cells, a human kidney-derived cell line. When cell lysates were analyzed by immunoblotting with human anti-HIV-1 IgG (Fig. VIIIA), monoclonal anti-p24 (Fig. VIIIB), and rabbit anti-RT (Fig. VIIIC), Gag p55, Pol p110 and Gag-Pol p160 precursor proteins were detected in hGag, hPol, and hGag-Pol fusion plasmids transfected 293T cells, as was expected. Mature virion proteins, p24 and RTp66, were detected in the hGag-Pol gene transfected cells (Figs. VIIIA, B and C). This might be a result of the activation of protease inside cells which was itself a result of the high-level expression of Gag and Gag-Pol protein (Karacostas, V et al., 1993, Virology, **193**:661-671). The expression of Gag precursor proteins from codon-altered vectors was ≥10-fold higher than viral Gag-Pol (Fig. VIII), determined by quantitative phosphorimaging. The level of accumulated Gag-Pol fusion protein was 100-fold higher in cells transfected with hGag-Pol compared to viral Gag-Pol. Virus-like particles were released from the hGag gene transfected cells (Fig. IX), detected by transmission electron microscopy. Though such particles were observed at a lower frequency with hGag-Pol, no particles were seen in cells transfected with hGag-PolΔFsΔPr or hPol vectors. Stable expression of HIV-1 Gag and Pol proteins from codon-optimized genes in mouse CT26 and BH10ME cells was also observed (Fig. VIIID).

Induction of HIV-1 Gag and Pol CTL Responses in Mice by DNA Vaccination

To evaluate the cellular immune response to HIV-1 Gag and Pol proteins, Balb/C female mice were injected intramuscularly with the eukaryotic expression vector plasmids containing the codon-optimized genes. Two weeks after the final vaccination, splenocytes were harvested from the immunized mice and sensitized with either Gag or Pol peptide-pulsed naïve mouse splenocytes. One week later, CTL responses were analyzed using a 5-hour chromium release assay.

CTL responses specific to HIV-1 Gag and/or Pol were first analyzed using Gag or Pol peptide-pulsed BC10ME cells, or mouse fibrosarcoma cell lines derived from B/C-N cells (Collins, JL et al., 1981, J Exp. Med., **153**:89-106). Immunization with hGag, hGag-PolΔFSΔPr or hGag-Pol genes induced comparably strong CTL responses specific to Gag (Fig. XA); however, after immunization with hPol, hGag-

PolΔFSΔPr or hGag-Pol genes, only the fusion protein, hGag-PolΔFSΔPr, and hPol to a lesser extent, elicited a marked CTL response to Pol (Fig. XB). To confirm that the specific killing in the CTL assays was induced by $CD8^+$ cytotoxic T lymphocytes, $CD4^+$ or $CD8^+$ cells were depleted from sensitized splenocytes by Dynal beads (Dynal, Inc., Lake Success, NY). Depletion of $CD8^+$ cells abolished the specific lysis in the hGag-Pol ΔFSΔPr gene-immunized mice, while depletion of $CD4^+$ had little effect on lysis (Fig. XC), suggesting that $CD8^+$ lymphocytes were responsible for specific cytotoxicity.

The responses were further analyzed and confirmed with the hGag or hPol gene transduced syngeneic CT26 and BC10ME cell lines. Responses to Gag in the mice immunized with the hGag, hGag-PolΔFSΔPr or hGag-Pol genes were similar when peptide-pulsed cells were used as targets in the CTL assay (Fig. XIA). Mice immunized with the hPol gene generated a specific response to HIV-1 Pol on BC10ME cell lines stably expressing Pol as target cells (Fig. XIB). The same results have been observed with CT26 cell lines. These stably transfected cell lines were therefore more sensitive as target cells than peptide-pulsed cells in the Pol CTL assays.

Antibody Response in the Immunized Mice

Sera from mice immunized with different plasmids was analyzed with a p24 ELISA. hGag immunized mice demonstrated the highest p24 antibody titers (Fig. XIIA). Unexpectedly, hGag-Pol virus-like particles elicited the lowest levels of p24 antibody. Similar results were observed by Western blotting with pooled sera (Fig. XIIB). The HIV-1 Pol specific antibodies were not detected by a commercially available Western blotting kit (Fig. XIIB), but antibodies to Pol were detected in mice immunized with hPol and hGag-PolΔFSΔPr with a more sensitive method, IP/Western blotting (Fig. XIIC). Presumably, this assay is more sensitive and better able to detect native conformational epitopes. Though such antibodies were found in mice immunized with Pol and Gag-Pol fusion proteins in this assay, minimal response was detected in the mice immunized with hGag-Pol. Though both immunogens elicited similar Gag responses, the Gag-Pol fusion protein was therefore more effective in the stimulation of CTL and antibody responses to Pol.

HIV Gag-Pol Fusion Proteins

In this disclosure, HIV-1 B-clade Gag and Pol genes were modified to increase Rev-independent expression of HIV-1 Gag-Pol proteins. This modification

allowed synthesis of HIV Gag and Pol, as well as fusion proteins at levels 10- to 100-fold higher than the corresponding Rev-dependent viral gene in the absence of Rev and RRE elements. These viral proteins were recognized by standard polyclonal and monoclonal antibodies (Fig. VIII), and immature VLP were produced and released from 293T cells transfected with hGag (Fig. IX).

The immune response induced by Rev-independent Gag-Pol was directed against both Gag and Pol determinants. The hGag, hGag-Pol fusion and hGag-Pol all induced strong CTL responses specific for Gag in mice immunized with plasmid DNA, but a significant Pol response was elicited only in the mice immunized with the hGag-PolΔFSΔPr or Pol alone. Because immunization with hGag-Pol gene failed to induce detectable cellular or humoral responses to HIV-1 Pol protein, these findings indicate that the Gag-Pol fusion protein induces a broader range of responses and allows delivery of an immunogen with a larger number of epitopes in a single continuous open reading frame. During viral replication, viral gag-pol produces Gag precursor protein and the gag-pol fusion protein by frame shifting in a 20:1 ratio (Wilson, W et al., 1988, Cell, 55:1159-1169). The deletion of a frame shift site in hGag-PolΔFSΔPr results in production of only the Gag-Pol fusion protein. Expression of Gag-Pol proteins alone in human cells is not adequate to form releasable viral particles because HIV-1 viral assembly requires Gag precursor proteins (Park, J and CD Morrow, 1992, J Virol, 66:6304-6313; Smith, AJ et al., 1993, J Virol, 67:2266-2275). The ability of hGag-PolΔFSΔPr to elicit strong Gag and Pol specific CTL responses in mice may be explained by high level expression of Gag-Pol fusion protein and its retention on the inside of cells, which could create a new condition not existing during normal viral replication and could provide sufficient proteins for antigen presentation. Moreover, the mutation in viral protease prevents viral protein from intracellular activation and reduced cellular toxicity. Overexpression of this polyprotein is also likely to affect its intracellular localization/transport and is envisioned as improving antigen presentation.

The Pol gene of HIV-1 is the precursor protein for viral protease, reverse transcriptase and integrase, which are crucial to viral replication (Kohl, NE et al., 1988, Proc. Natl. Acad. Sci. USA, 85:4686-4690.). Retroviral extracellular maturation, resulting from self-activation of protease after release produces mature RT and IN which have important functions in reverse transcription and integration respectively, for HIV-1, HIV-2, and SIV replication. The catalytic cores of these

enzymes have relatively conserved domains in order to preserve their functions and thus are envisioned as inducing cross-clade CTL responses. As early as 1988, CTLs specific for HIV-1 RT were found in blood samples from HIV-1 infected individuals (Hosmalin, A et al., 1990, Proc. Natl. Acad. Sci. USA, 87:2344-2348; Walker, BD et al., 1988, Science, 240:64-66.). Relatively strong Gag-specific CTL responses have been shown in numerous non-human primate and human studies, using DNA vaccines or a live recombinant vector containing viral Gag-Pol constructs (Evans, TG, 1999, J Infect Dis, 180:290-298; Ferrari, G, 1997, Blood, 90:2406-2416; Gorse, GJ et al., 1999, Vaccine, 18:835-849; Seth, A, 1998, Proc. Natl. Acad. Sci. USA, 95:10112-10116; Seth, A et al., 2000, J Virol, 74:2502-2509), but fewer Pol-specific CTL responses have been reported. The detection of significant CTL responses specific to Pol in our disclosure may be attributed in part to establishment of stable Pol expressing cell lines, in which codon alteration and inactivation of FS and PR in the Pol gene allow high level expression of the Pol protein without cellular toxicity. Though it remains possible that the hGag-Pol, or a combination of hGag and hPol, may exert similar effects with appropriate adjuvants or with different prime-boost regimens, the Rev-independent Gag-Pol fusion protein stimulates HIV-1 Gag and Pol specific CTL responses in mice and is envisioned as proving useful in an AIDS vaccine.

PLASMID DESCRIPTIONS

Env Plasmids

VRC2100

pVR1012x/s R5gp139-Nef (delta) MHC (delta) CD4/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. The envelope protein gene from pX4gp160/h (Nabel lab #1272) was ligated in frame with the mutant Nef gene from pNefDMHCDCD4/h (Nabel lab #1278) to produce

pX4gp139-NefDMHCDCD4/h. The envelope-Nef fusion protein expressed from pX4gp139-NefDMHCDCD4/h contains the first 668 amino acids from the HIV envelope glycoprotein (gp139) fused to the entire mutant Nef protein. The truncated envelope polyprotein (gp139) contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain and regions important for oligomer formation. The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit both MHC class I and CD4 expression, point mutations were introduced into the Nef gene from pNef/h (Nabel lab #1275). The resulting amino acids substitutions in pNefDMHCDCD4/h are: P69A, P72A, P75A, P78A, D174A and D175A. X4gp139-NefDMHCDCD4/h is expressed from the pVR1012x/s (Nabel lab #1267) vector backbone.

VRC2200

pVR1012x/s R5gp157-Nef (delta) MHC (delta) CD4/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, bu t the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (Nabel lab number 1272) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The envelope-Nef fusion protein expressed from pR5gp157-Nef/h contains the first 820 amino acids from the HIV envelope glycoprotein (gp157) fused to the entire mutant Nef protein. The gene for gp157 was ligated in frame with the full-length mutant Nef gene from pNefDMHCDCD4/h (Nabel lab #1278) to produce pR5gp157-NefDMHCDCD4/h. The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit both MHC class I and CD4 expression, point mutations

were introduced into the Nef gene from pNef/h (Nabel lab #1275). The resulting amino acids substitutions in pNefDMHCDCD4/h are: P69A, P72A, P75A, P78A, D174A and D175A. R5gp157-NefDMHCDCD4/h is expressed from the pVR1012x/s (Nabel lab #1267) vector backbone.

VRC2300

pVR1012x/s X4 gp139-Nef deltaMHC deltaCD4/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. The envelope protein gene from pX4gp160/h (Nabel lab #1272) was ligated in frame with the mutant Nef gene from pNefDMHC/h (Nabel lab #1276) to produce pX4gp139-NefDMHC/h. The envelope-Nef fusion protein expressed from pX4gp139-NefDMHC/h contains the first 668 amino acids from the HIV envelope glycoprotein (gp139) fused to the entire mutant Nef protein. The truncated envelope polyprotein (gp139) contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain and regions important for oligomer formation. The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit MHC class I expression, point mutations were introduced into the Nef gene from pNef/h (Nabel lab #1275). The resulting amino acids substitutions in pNefDMHC/h are: P69A, P72A, P75A, and P78A. X4gp139-NefDMHC/h is expressed from the pVR1012x/s (Nabel lab #1267) vector backbone

VRC2302

pVR1012x/s X4gp130-Nef/h

For the X4gp130/h (VRC2703) portion, the protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons

optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 602. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. Regions important for oligomer formation may be partially functional. This X4gp130/h (VRC2703) gene was fused to Nef gene. The Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create the viral Nef gene (pVR1012-Nef)(Nabel Lab #1093. The nucleotide sequence is homologous to the viral gene, and the protein encoded is the same. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2400

pVR1012x/s X4gp157-NefDMHCDCD4/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. The envelope-Nef fusion protein expressed from pX4gp157-NefDMHCDCD4/h contains the first 820 amino acids from the HIV envelope glycoprotein (gp157) fused to the entire mutant Nef protein. The truncated envelope polyprotein (gp157) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The gene for gp157 was ligated in frame with the full-length mutant Nef gene from pNefDMHCDCD4/h (VRC3600) to produce pX4gp157-NefDMHCDCD4/h. The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit both

MHC class I and CD4 expression, point mutations were introduced into the Nef gene from pNef/h (VRC3500). The resulting amino acids substitutions in pNefDMHCDCD4/h are: P69A, P72A, P75A, P78A, D174A and D175A. X4gp160-NefDMHCDCD4/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC2700

pVR1012x/s X4gp140/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2701

pVR1012x/s X4gp140(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking

the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2702

pVR1012x/s X4gp128(del F/CL)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 592. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2706

pVR1012x/s X4gp145/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 704. The truncated envelope polyprotein contains the entire

SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2707

pVR1012x/s X4gp145(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 704. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2800

pVR1012x/s R5gp140/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were

replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-lenth R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2801

pVR1012x/s R5gp140(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-lenth R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2804

pVR1012x/s R5gp145/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession

number M68893, again using human preferred codons). The full-lenth R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2805

pVR1012x/s R5gp145(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-lenth R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2810

pVR1012 x/s R5gp140delC1(delCFI)/h

Constant domain 1 was deleted from gp140delCFI from amino acid 33-127 and was replaced with a NheI site.

VRC 2811

pVR1012 x/s R5gp140delC2 (delCFI)/h

Constant domain 2 was deleted from gp140delCFI from amino acid 199-293, and was replaced with an NheI site

VRC2812

pVR 1012 x/s R5gp140delC3 (delCFI)/h

Constant domain 3 was deleted from gp140delCFI from amino acid 333-380, and was replaced with an NheI site.

VRC2813

pVR1012 x/s R5gp140delC4 (delCFI)/h

Constant domain 4 was deleted from gp140delCFI from amino acide 419-458, and was replaced with an NheI site.

VRC2814

pVR1012 x/s R5gp140delC5 (delCFI)/h

Constant domain 5 was deleted from gp140delCFI from amino acid 472 -498 and was replaced with an NheI site.

VRC 2820

pVR1012x/s R5gp140(dCFI)/dV1

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the

gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1 loop (a.a.129 to 154) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2821

pVR1012x/s R5gp140(dCFI)/dV2

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2 loop (a.a.160 to 193) and transmembrane domain.

Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2822

pVR1012x/s R5gp140(dCFI)/dV3

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V3 loop (a.a.299 to 327) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2823

pVR1012x/s R5gp140(dCFI)/dV4

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The

nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V4 loop (a.a.386 to 413) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2824

pVR1012x/s R5gp140(dCFI)/dV12

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1, V2 loops (a.a.129 to 154,and a.a.160 to 193) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required

for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2825

pVR1012x/s R5gp140(dCFI)/dV13

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1, V3 loops (a.a.129 to 154,and a.a.299 to 327) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2826

pVR1012x/s R5gp140(dCFI)/dV14

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the

gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1, V4 loops (a.a.129 to 154,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2827

pVR1012x/s R5gp140(dCFI)/dV23

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion

domain, but lacking the V2, V3 loops (a.a.160 to 193,and a.a.299 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2828

pVR1012x/s R5gp140(dCFI)/dV24

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2, V4 loops (a.a.160 to 193,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2829

pVR1012x/s R5gp140(dCFI)/dV34

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V3, V4 loops (a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2830

pVR1012x/s R5gp140(dCFI)/dV123

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were

replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V2,V3 loops (a.a. 129 to 154, a.a.160 to 193,and a.a.299 to 327) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2831

pVR1012x/s R5gp140(dCFI)/dV124

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V2,V4 loops (a.a. 129 to 154, a.a.160 to 193,and a.a.386 to 413) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for

oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2832

pVR1012x/s R5gp140(dCFI)/dV134

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V3,V4 loops (a.a. 129 to 154, a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2833

pVR1012x/s R5gp140(dCFI)/dV234

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L,

N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2,V3,V4 loops (a.a. 160 to 193, a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2834

pVR1012x/s R5gp140(dCFI)/dV1234

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V2,V3,V4 loops (a.a. 129 to 154, a.a. 160 to 193, a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage

(F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2835

pAdApt R5gp140(dCFI)/dV1

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1 loop (a.a.129 to 154) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2836

pAdApt R5gp140(dCFI)/dV2

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the

protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2 loop (a.a.160 to 193) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is AdApt.

VRC 2837

pAdApt R5gp140(dCFI)/dV3

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V3 loop (a.a.299 to 327) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been

deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2838

pAdApt R5gp140(dCFI)/dV4

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V4 loop (a.a.386 to 413) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2839

pAdApt R5gp140(dCFI)/dV12

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L,

N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1, V2 loops (a.a.129 to 154,and a.a.160 to 193) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2840

pAdApt R5gp140(dCFI)/dV13

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1, V3 loops (a.a.129 to 154,and a.a.299 to 327) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2,

from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2841

pAdApt R5gp140(dCFI)/dV14

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1, V4 loops (a.a.129 to 154,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2842

pAdApt R5gp140(dCFI)/dV23

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an

R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2, V3 loops (a.a.160 to 193,and a.a.299 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2843

pAdApt R5gp140(dCFI)/dV24

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2, V4 loops (a.a.160 to 193,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from

amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2844

pAdApt R5gp140(dCFI)/dV34

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V3, V4 loops (a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2845

pAdApt R5gp140(dCFI)/dV123

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an

R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V2,V3 loops (a.a. 129 to 154, a.a.160 to 193,and a.a.299 to 327) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt

VRC 2846

pAdApt R5gp140(dCFI)/dV124

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V2,V4 loops (a.a. 129 to 154, a.a.160 to 193,and a.a.386 to 413) and transmembrane domain. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad

(H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2847

pAdApt R5gp140(dCFI)/dV134

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V3,V4 loops (a.a. 129 to 154, a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2848

pAdApt R5gp140(dCFI)/dV234

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the

protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V2,V3,V4 loops (a.a. 160 to 193, a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC 2849

pAdApt R5gp140(dCFI)/dV1234

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 680. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the V1,V2,V3,V4 loops (a.a. 129 to 154, a.a. 160 to 193, a.a.299 to 327,and a.a.386 to 413) and transmembrane domain. Heptad(H) 1, Heptad

2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pAdApt.

VRC2850

pVR1012 x/s R5gp145delC1 (delCFI)/h

Constant domain 1 was deleted from gp145delCFI from amino acid 33-127 and was replaced with an Nhe I site.

VRC2851

pVR1012 x/s R5gp145delC2 (delCFI)/h

Constant domain 2 was deleted from gp145dCFI from amino acid 199-293 and was replaced with an Nhe I site.

VRC2852

pVR1012 x/s R5gp145delC3 (delCFI)/h

Constant domain 3 was deleted from gp145delCFI from amino acide 333-380 and was replaced with an Nhe I site.

VRC2853

pVR1012 x/s R5gp145delC4 (delCFI)/h

Constant domain 4 was deleted from gp145delCFI from amino acid 419-458 and was replaced with an Nhe I site.

VRC2854

pVR1012 x/s R5gp145delC5 (delCFI)/h

Constant domain 5 was deleted from gp145delCFI from amino acid 472-498 and was replaced with an Nhe I site.

VRC 2860

pVR1012x/s R5gp145(dCFI)/h/dV1

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The V1 loop (a.a. 129-154) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2861

pVR1012x/s R5gp145(dCFI)/h/dV2

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with

the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The V2 loop (a.a. 160-193) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2862

pVR1012x/s R5gp145(dCFI)/h/dV3

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The V3 loop (a.a. 299-327) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2863

pVR1012x/s R5gp145(dCFI)/h/dV4

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V4 loop (a.a. 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2864

pVR1012x/s R5gp145(dCFI)/h/dV12

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession

number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The V1, V2 loops (a.a. 129-154 and 160-193) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2865

pVR1012x/s R5gp145(dCFI)/h/dV13

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V1, V3 loops (a.a. 129-154 and 299-327) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2866

pVR1012x/s R5gp145(dCFI)/h/dV14

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V1, V4 loops (a.a. 129-154 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2867

pVR1012x/s R5gp145(dCFI)/h/dV23

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession

number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V2, V3 loops (a.a. 160-193 and 299-327) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2868

pVR1012x/s R5gp145(dCFI)/h/dV24

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V2, V4 loops (a.a. 160-193 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2869

pVR1012x/s R5gp145(dCFI)/h/dV34

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V3, V4 loops (a.a. 299-327 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2870

pVR1012x/s R5gp145(dCFI)/h/dV134

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession

number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V1, V3, V4 loops (a.a. 129-154, 299-327 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2871

pVR1012x/s R5gp145(dCFI)/h/dV234

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The V2, V3, V4 loops (a.a. 160-193, 299-327 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2872

pVR1012x/s R5gp145(dCFI)dv123/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V1, V2, V4 loops (a.a. 129-154, 160-193 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2873

pVR1012x/s R5gp145(dCFI)/h/dV124

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession

number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V1, V2, V4 loops (a.a. 129-154, 160-193 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 2874

pVR1012x/s R5gp145(dCFI)/h/dV1234

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, and P470L. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-length R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 704. The truncated envelope polyprotein (gp145) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad (H) 1, Heptad 2 and their Interspace (IS) are required for oligomerization. The V1, V2, V3, V4 loops (a.a. 129-154, 160-193, 299-327 and 386-413) and Fusion and Cleavage (F/CL) domains (a.a. 503-536) have been deleted. Also, the Interspace (IS) between Heptad (H) 1 and 2 (a.a.593-620) have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC2900

pVR1012x/s R5gp150/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The full-lenth R5-tropic version of the envelope protein gene from pR5gp160/h (VRC3000) was terminated after the codon for amino acid 752. The truncated envelope polyprotein (gp150) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. The expression vector backbone is pVR1012x/s (VRC2000).

VRC3000

pVR1012x/s R5gp160/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3200

pVR1012x/s X4gp150/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. The full-lenth X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 752. The truncated envelope polyprotein (gp150) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. The expression vector backbone is pVR1012x/s (VRC2000).

VRC3201

pVR1012x/s X4gp150(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. The full-lenth X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 752. The truncated envelope polyprotein (gp150) contains the entire SU protein and a portion of the TM protein including the fusion domain, the transmembrane domain, and regions important for oligomer formation. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC3202

pVR1012x/s X4gp150 Δgly/h.

Eukaryotic vector with humanized codons expressing the HIV envelope glycoprotein gp150 from HXB2, X4 tropic mutated in the Glycosylation sites. VRC3202 pVR1012x/s X4gp150Dgly/h The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4- tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To disrupt potential glycoslylation sites in the HIV-1 envelope proteins, point mutations were introduced into the full-length X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300). The resulting amino acids substitutions in X4gp160Dgly/h are: N88D, N156D, N160D, N197E, N230D, N234D, N241D, N276D, L288V, N289D, S291T, N295D, N332D, N339D, N356D, N386D, and N448D. The full-length X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 752. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3203

pVR1012x/s X4gp150 ΔB Δgly/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The ΔB designation means the amino acids from 1-307 (XbaI to EcoR1). The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To disrupt potential glycoslylation sites in the HIV-1 envelope proteins, point mutations were introduced into the full-lenth X4-tropic version of the envelope protein gene from pX4gp160/h

(VRC3300). The resulting amino acids substitutions in X4gp160Dgly/h are: N88D, N156D, N160D, N197E, N230D, N234D, N241D, N276D, L288V, N289D, S291T, and N295D. The full-lenth X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 752. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3300

pVR1012x/s X4gp160/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3301

pVR1012x/s X4gp160(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. Full length SU and TM proteins are Expressed. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC3400

pVR1012x/s X4gp160Δgly/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To disrupt potential glycoslylation sites in the HIV-1 envelope proteins, point mutations were introduced into the full-lenth X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300). The resulting amino acids substitutions in X4gp160Dgly/h are: N88D, N156D, N160D, N197E, N230D, N234D, N241D, N276D, L288V, N289D, S291T, N295D, N332D, N339D, N356D, N386D, and N448D. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3401

pVR1012x/s X4gp160AB mut Δgly/h

The protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The AB designation means the amino acids from 1-307 (XbaI to EcoR1). The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To disrupt potential glycoslylation sites in the HIV-1 envelope proteins, point mutations were introduced into the full-lenth X4-tropic version of the envelope protein gene from pX4gp160/h (VRC3300). The resulting amino acids substitutions in X4gp160Dgly/h are: N88D, N156D, N160D, N197E, N230D, N234D, N241D, N276D, L288V, N289D, S291T, and N295D. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3500

pVR1012x/s Nef/h

The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. The nucleotide sequence Nef/h shows little homology to the viral gene, but the protein encoded is the same. Nef/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3600

pVR1012x/s NefDMHCDCD4/h

The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit both MHC class I and CD4 expression point mutations were introduced into the Nef gene from pNef/h (VRC3500). The resulting amino acids substitutions in pNefDMHCDCD4/h are: P69A, P72A, P75A, P78A, D174A and D175A. pNefDMHCDCD4/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3700

pVR1012x/s NefDCD4/h

The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version o f the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit CD4 expression, point mutations were introduced into the Nef gene from pNef/h (VRC3500). The resulting amino acids substitutions in pNefDCD/h are: D174A and D175A. pNefDCD4/h is expressed from the pVR1012x/s (VRC2000) vector backbone. VRC3700 pVR1012x/s NefDCD4/h The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version o f the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit CD4 expression,

point mutations were introduced into the Nef gene from pNef/h (VRC3500). The resulting amino acids substitutions in pNefDCD/h are: D174A and D175A. pNefDCD4/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC3800

pVR1012x/s NefDMHC/h

The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit MHC class I expression, point mutations were introduced into the Nef gene from pNef/h (VRC3500). The resulting amino acids substitutions in pNefDMHC/h are: P69A, P72A, P75A, and P78A. pNefDMHC/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC5200

pVR1012x/s 89.6Pgp128(del F/CL)/h

The protein sequence of the envelope polyprotein (gp160) from 89.6P (Dual-tropic, GenBank accession number u89134/LOCUS:SIU89134) was used to create a synthetic version of the gene (89.6Pgp160/h) using codons optimized for expression in human cells. The nucleotide sequence 89.6Pgp160/h shows little homology to the 89.6P gene, but the protein encoded is the same. The full-lenth 89.6P, dual-tropic version of the envelope protein gene from 89.6P gp160/h (VRC3000) was terminated after the codon for amino acid 596. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. The Fusion and Cleavage (F/CL) domains, from amino acids 508-541, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5201

pVR1012x/s 89.6Pgp140(del F/CL del H IS/h

The protein sequence of the envelope polyprotein (gp160) from 89.6P (dual-tropic, GenBank accession number u89134/locus SIU89134) was used to create a synthetic

version of the gene (Dualtropic gp160/h) using codons optimized for expression in human cells. The nucleotide sequence dualtropic gp160/h shows little homology to the 89.6P gene, but the protein encoded is the same. The full-lenth 89.6P, dual-tropic version of the envelope protein gene was terminated after the codon for amino acid 683. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 508-541, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 597-625, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5202

pVR1012x/s 89.6Pgp145(del F/CL del H IS/h

The protein sequence of the envelope polyprotein (gp160) from 89.6P (dual-tropic, GenBank accession number u89134/locus SIU89134) was used to create a synthetic version of the gene (Dualtropic gp160/h) using codons optimized for expression in human cells. The nucleotide sequence dualtropic gp160/h shows little homology to the 89.6P gene, but the protein encoded is the same. The full-lenth 89.6P, dual-tropic version of the envelope protein gene was terminated after the codon for amino acid 709. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 508-541, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 597-625, have been deleted. Regions important for oligomer formation may be partially functional. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5203

pVR1012x/s 89.6Pgp160/h

The protein sequence of the envelope polyprotein (gp160) from 89.6P (Dual-tropic, GenBank accession number U89134/LOCUS: SIU89134) was used to create a synthetic version of the gene (dual tropic gp160/h) using codons optimized for expression in human cells. The nucleotide sequence 89.6P gp160/h shows little homology to the 89.6P gene, but the protein encoded is the same. Full length SU and TM proteins are expressed from the pVR1012x/s (VRC2000) vector backbone

VRC5300

pVR1012x/s R5(clade C)gp140(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from 92br025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (R5gp160/h) using codons optimized for expression in human cells. The nucleotide sequence R5gp160/h shows little homology to the 92br025 gene, but the protein encoded is the same. The full-length R5-tropic version of the envelope protein was synthesized by Operon under the name: kongene. The XbaI (18nt up-stream from ATG) to BglII (1376nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BglII sites of VRC2701 pVR1012x/s X4gp140(del F/CL del H IS)/h backbone. Therefore, the gene is R5 (clade C) gp160/h up to the BglII site (1376nt from ATG) and the rest of the gene after BglII site is VRC2701 pVR1012x/s X4gp140(del F/CL del H IS)/h. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000). The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 680.

VRC5301

pVR1012x/s R5(clade C)gp145(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from 92br025 (R5-tropic, GenBank accessionnumber U52953) was used to create a synthetic version of the gene (R5gp160/h) using codons optimized for expression in human cells. The nucleotide sequence R5gp160/h shows little homology to the 92br025 gene, but the protein encoded is the same. The full-length R5-tropic version of the envelope protein was synthesized by Operon under the name: kongene. The XbaI (18nt up-stream from ATG) to BglII (1376nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BglII sites of VRC2701 pVR1012x/s X4gp140(del F/CL del H IS)/h backbone. Therefore, the gene is R5 (clade C) gp160/h up to the BglII site (1376nt from ATG) and the rest of the gene after BglII site is VRC2707 pVR1012x/s X4gp145(del F/CL del H IS)/h. The truncated envelope polyprotein contains the entire SU protein and a portion of the TM protein including the fusion domain, but lacking the transmembrane domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 503-536, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 593-620, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000). The full-lenth X4-tropic version of the envelope protein from pX4gp160/h (VRC3300) was terminated after the codon for amino acid 704.

VRC5303

pVR1012x/s R5gp145CladeC(Brazil) delCFI/h

Authentic Clade C unlike 5301 which is a hybrid between C and B.

VRC 5304

pVR1012x/s R5(clade A)gp140(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from 92rw020 (R5-tropic, GenBank accessionnumber U51283) was used to create a synthetic version of the

gene (Clade-A gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the 92rw020 gene, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1837 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains the entire SU protein and the TM domain, but lacking the the Fusion domain and Cytoplasmic domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 486-519, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 576-604, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5305

pVR1012x/s R5(clade A)gp145(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp160) from 92rw020 (R5-tropic, GenBank accessionnumber U51283) was used to create a synthetic version of the gene (Clade-A gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the 92rw020 gene, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1912 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains the entire SU protein and the TM domain, but lacking the the Fusion domain and Cytoplasmic domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 486-519, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 576-604, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5306

pVR1012x/s R5(clade E)gp140(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 93th966.8 (R5-tropic, GenBank accessionnumber U08456) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 93th966.8, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1856 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains the entire SU protein and the TM domain, but lacking the the Fusion domain and Cytoplasmic domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 497-530, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 588-613, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5307

pVR1012x/s R5(clade E)gp145(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 93th966.8 (R5-tropic, GenBank accessionnumber U08456) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 93th966.8, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1928 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains the entire SU protein and the TM domain, but lacking the the Fusion domain and Cytoplasmic domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 497-530, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from

amino acids 588-613, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5308

pVR1012x/s R5(clade C South African)gp140(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accessionnumber AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1833 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains the entire SU protein and the TM domain, but lacking the the Fusion domain and Cytoplasmic domain. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 487-520, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 577-605, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5309

pVR1012x/s R5(clade C South African)gp145(del F/CL del H IS)/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accessionnumber AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains the entire SU protein and the TM domain, but lacking the the Fusion domain and Cytoplasmic domain. Regions important for oligomer formation may be

partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The Fusion and Cleavage (F/CL) domains, from amino acids 487-520, have been deleted. The Interspace (IS) between Heptad (H) 1 and 2, from amino acids 577-605, have been deleted. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5350

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV1

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1 loop(a.a.133-148) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5351

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV12

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into

the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V2 loops (a.a.133-191) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5352

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV123

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V2,V3 loops (a.a.130-191, 330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5353

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV1234

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little

homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V2,V3,V4 loops (a.a.130-191, 330-358, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5354

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV124

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V2,V4 loops (a.a. 130-191, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5355

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV13

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V3 loops (a.a.133-148, 330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5356

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV134

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V3,V4 loops (a.a.130-148, 330-358, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad

2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5357

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV14

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V4 loops (a.a. 130-148, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5358

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV2

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2 loop(a.a.154-191) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS)

between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5359

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV23

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2,V3 loops (a.a. 154-191, 330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5360

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV234

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into

the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2,V3,V4 loops (a.a.154-191, 330-358, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5361

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV24

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2,V4 loops (a.a. 154-191, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5362

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV3

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little

homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V3 loop(a.a.330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5363

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV34

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V3,V4 loops (a.a.330-358, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5364

pVRC1012(x/s)-gp140(dCFI)(Brazil C)/dV4

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp140(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V4 loop(a.a.384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), transmembrane domain, and cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5365

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV1

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1 loop(a.a.133-148) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional.

Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5366

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV12

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V2 loops (a.a.133-191) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5367

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV123

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1, V2,V3 loops (a.a. 133-191,330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic

domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5368

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV1234

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V2, V3,V4 loops (a.a. 133-191,330-358,384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5369

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV124

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1, V2,V4 loops (a.a. 133-148,154-191,384-

408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5370

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV13

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V3 loops (a.a.133-148, 330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5371

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV134

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into

the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1, V3,V4 loops (a.a. 133-148,330-358,384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5372

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV14

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V1,V4 loops (a.a.133-148, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5373

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV2

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI

(18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2 loop (a.a.154-191) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5374

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV23

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2,V3 loops (a.a.154-191,330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5375

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV234

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little

homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2, V3,V4 loops (a.a. 154-191,330-358,384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5376

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV24

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V2,V4 loops (a.a.154-191, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5377

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV3

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version

of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V3 loop (a.a.330-358) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5378

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV34

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V3,V4 loops (a.a.330-358, 384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5379

PVRC1012(x/s)-gp145(dCFI)(Brazil C)/dV4

The protein sequence of the envelope polyprotein (gp160) from 92BR025 (R5-tropic, GenBank accession number U52953) was used to create a synthetic version of the gene (Brazil-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence of Brazil-C gp145(delCFI) shows little homology to the gene 92BR025, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1910 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein contains deletion in the V4 loop (a.a.384-408) of the SU protein. It also lacks the Fusion and Cleavage (F/CL) domains(a.a. 496-529), the Interspace (IS) between Heptad (H) 1 and 2(a.a. 586-612), and Cytoplasmic domain in the TM protein. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5500

pVR1012x/s R5(SA-C)gp140(dCFI) dV1/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1 loop (a.a.136-150), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5501

pVR1012x/s R5(SA-C)gp140(dCFI) dV12/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V2 loops (a.a.136-194), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC 5502

pVR1012x/s R5(SA-C)gp140(dCFI) dV123/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V2, V3 loops (a.a. 136-194, 297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5503

pVR1012x/s R5(SA-C)gp140(dCFI)dV1234/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V2, V3,V4 loops (a.a.136-194,297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5504

pVR1012x/s R5(SA-C)gp140(dCFI)dV124/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V2, V4 loops (a.a. 136-194, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their

Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5505

pVR1012x/s R5(SA-C)gp140(dCFI)dV13/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V3 loops (a.a.136-150, 297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5506

pVR1012x/s R5(SA-C)gp140(dCFI)dV134/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V3, V4 loops (a.a. 136-150, 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions

important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5507

pVR1012x/s R5(SA-C)gp140(dCFI)dV14/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V4 loops (a.a.136-150, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5508

pVR1012x/s R5(SA-C)gp140(dCFI)dV2/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2 loop (a.a.156-194), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane

domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5509

pVR1012x/s R5(SA-C)gp140(dCFI)dV23/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2, V3 loops (a.a.156-194, 297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5510

pVR1012x/s R5(SA-C)gp140(dCFI)dV234/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2, V3, V4 loops (a.a. 156-194, 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2

(a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5511

pVR1012x/s R5(SA-C)gp140(dCFI)dV24/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2, V4 loops (a.a.156-194, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5512

pVR1012x/s R5(SA-C)gp140(dCFI)dV3/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V3 loop (a.a.297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520),

the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5513

pVR1012x/s R5(SA-C)gp140(dCFI)dV34/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V3, V4 loops (a.a. 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5514

pVR1012x/s R5(SA-C)gp140(dCFI)dV4/h

The protein sequence of the envelope polyprotein (gp140delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp140delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp140delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V4 loop (a.a 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520),

the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), the transmembrane domain and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5515

pVR1012x/s R5(SA-C)gp145(dCFI)dV1/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1 loop (a.a.136-150), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5516

pVR1012x/s R5(SA-C)gp145(dCFI)dV12/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1,V2 loops (a.a.136-194), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the

intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5517

pVR1012x/s R5(SA-C)gp145(dCFI)dV123/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V2, V3 loops (a.a.136-194, 297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5518

pVR1012x/s R5(SA-C)gp145(dCFI)dV1234/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1,V2,V3 ,V4 loops (a.a.136-194, 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer

formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5519

pVR1012x/s R5(SA-C)gp145(dCFI)dV2/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2 loop (a.a.156-194), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5520

pVR1012x/s R5(SA-C)gp145(dCFI)dV23/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2, V3 loops (a.a.156-194, 297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially

functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5521

pVR1012x/s R5(SA-C)gp145(dCFI)dV234/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2, V3 ,V4 loops (a.a.156-194, 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5522

pVR1012x/s R5(SA-C)gp145(dCFI)dV24/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V2, V4 loops (a.a.156-194, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially

functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5523

pVR1012x/s R5(SA-C)gp145(dCFI)dV3/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V3 loop (a.a.297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5524

pVR1012x/s R5(SA-C)gp145(dCFI)dV34/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V3, V4 loops (a.a. 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially

functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5525

pVR1012x/s R5(SA-C)gp145(dCFI)dV4/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V4 loop (a.a.385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5526

pVR1012x/s R5(SA-C)gp145(dCFI)dV13/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V3 loops (a.a.136-150, 297-325), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially

functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5527

pVR1012x/s R5(SA-C)gp145(dCFI)dV134/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V3, V4 loops (a.a.136-150, 297-325, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5528

pVR1012x/s R5(SA-C)gp145(dCFI)dV124/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V2, V4 loops (a.a.136-150, 156-194, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer

formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

VRC5529

pVR1012x/s R5(SA-C)gp145(dCFI)dV14/h

The protein sequence of the envelope polyprotein (gp145delCFI) from 97ZA012 (R5-tropic, GenBank accession number AF286227) was used to create a synthetic version of the gene (Clade-C gp145delCFI) using codons optimized for expression in human cells. The nucleotide sequence R5gp145delCFI shows little homology to the gene 97ZA012, but the protein encoded is the same. The XbaI (18nt up-stream from ATG) to BamH1 (1914 nt down-stream from ATG) fragment which contains polylinker at the 5' end, Kozak sequence and ATG was cloned into the XbaI to BamH1 sites of pVR1012x/s backbone. The truncated envelope polyprotein lacks the V1, V4 loops (a.a.136-150, 385-399), the Fusion and Cleavage (F/CL) domains (a.a. 487-520), the Interspace (IS) between Heptad (H) 1 and 2 (a.a.577-605), and the intracellular region. Regions important for oligomer formation may be partially functional. Heptad(H) 1, Heptad 2 and their Interspace(IS) are required for oligomerization. The expression vector backbone is pVR1012x/s (VRC2000).

Gag-Pol Plasmids

VRC3900

pVR1012x/s Gag/h

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein to produce pGag(fs)Pol/h (VRC4200). The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene using codons optimized for expression in human cells. To produce a gene that

expresses all of the gag proteins, the region encoding pol amino acids 77-1003 were deleted from Gag(fs)Pol/h to produce Gag/h. This construct also encodes most of the protease (98 amino acids) gene encoding amino acids 3-77. Gag/h is expressed from the pVR1012x/s vector backbone.

VRC3901

pVR1012x/s SIV Gag/h

The protein sequence of the gag polyprotein (amino acid from 1-550) SIVmac239(GenBank accession number M33262) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the SIVMac239 gene, but the protein encoded is the same.

VRC4000

pVR1012x/s Gag-Pol/h

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. Gag-Pol/h is expressed from the pVR1012x/s vector backbone.

VRC4001

pVR1012x/s SIVGag-Pol/h

Eukaryotic vector with humanized codons expressing the Gag-pol gene of SIVmac239. The Sal I –XbaI fragment of SIV gag(VRC3901) was inserted into Sal I –XbaI of SIV Pol(VRC4101) to create VRC4001.

VRC4100

pVR1012x/s Pol/h

The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene using codons optimized for expression in human cells. To initiate translation at the beginning of Pol, a methionine codon was added to the 5'-end of the synthetic polymerase gene to create the Pol/h gene. Pol/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC4101

pVR1012x/s SIV Pol/h

The protein sequence of the pol polyprotein (amino acids 3-1017) from SIVmac239 (GenBank accession number M19921) was used to create a synthetic version of the pol gene using codons optimized for expression in human cells. To initiate translation at the beginning of Pol, a methionine codon was added to the 5'-end of the synthetic polymerase gene to create the Pol/h gene. The Protease (Pr) mutation is at pol amino acid 123 and is AAG->GGA or amino acids R->G. Reverse transcriptase(RT) mutation is at aa 352(GAC to CAT D(D to H) –RT) and Integrase mutation is at aa 788(GAC to GGC(D to A) –IN). Pol/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC4200

pVR1012x/s Gag(fs)Pol/h

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the

gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone.

VRC4300

pVR1012 Gag-Pol(d delta RT delta IN)/h

Eukaryotic vector with humanized codons expressing the Gag and the frame shifted Pol genes of HIV HXB2 subtype B with deletions in Reverse transcriptase, and Integrase regions. The protein sequence of the gag polyprotein (Pr55, amino acids1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express

the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6 The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. Note: This vector is not in the pVR1012x/s backbone.

VRC4301

pVR1012x/s-Gag(FS)-Pol-delta RT IN-IRES-R5 gp157-Nef

For the Gag(FS)Pol delta RT delta IN/h portion, VRC4302 pVR1012x/s Gag(fs)Pol(delta PR delta/h was used for the protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy- terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid

771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. This gene has been fused to an Internal Ribosomal Entry Site (IRES) and then fused to the R5gp157-Nef from VRC2200 pVR1012x/s R5gp157- NefDMHCDCD4/h in which the protein sequence of the envelope polyprotein (gp160) from HXB2 (X4-tropic, GenBank accession number K03455) was used to create a synthetic version of the gene (X4gp160/h) using codons optimized for expression in human cells. The nucleotide sequence X4gp160/h shows little homology to the HXB2 gene, but the protein encoded is the same with the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T. To produce an R5-tropic version of the envelope protein (R5gp160/h), the region encoding HIV-1 envelope polyprotein amino acids 275 to 361 from X4gp160/h (VRC3300) were replaced with the corresponding region from the BaL strain of HIV-1 (GeneBank accession number M68893, again using human preferred codons). The envelope-Nef fusion protein expressed from pR5gp157-Nef/h contains the first 820 amino acids from the HIV envelope glycoprotein (gp157) fused to the entire mutant Nef protein. The gene for gp157 was ligated in frame with the full-length mutant Nef gene from pNefDMHCDCD4/h (VRC3600) to produce pR5gp157- NefDMHCDCD4/h. The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. To disrupt the ability of Nef to limit both MHC class I and CD4 expression, point mutations were introduced into the Nef gene from pNef/h (VRC3500). The resulting amino acids substitutions in pNefDMHCDCD4/h are: P69A, P72A, P75A, P78A, D174A and D175A. R5gp157-NefDMHCDCD4/h is expressed from the pVR1012x/s (VRC2000) vector backbone.

VRC4302

pVR1012 Gag(delFS)Pol(delta PR delta RT delta IN)/h

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag

proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag- pol amino acid 1209 and is ACT->CAT or amino acids D->A. Note: This vector is not in the pVR1012x/s backbone.

VRC4303

pVR1012 SIV Gag(delFS)Pol(delta PR delta RT delta IN)/h

Eukaryotic vector with humanized codons expressing the Gag and the frame-shift-deleted Pol genes SIVmac239 with deletions in the Protease, Reverse transcriptase, and Integrase regions. The 5 of Ts from 3188 to 3192 of SIV gag-pol(VRC4001) were deleted to create VRC4303.

VRC4304

pVR1012 Gag (delFS)Pol delta PR delta RT delta IN/h

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HIV-1 C clade(GenBank accession number U52953) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The

nucleotide sequence of the synthetic gag gene shows little homology to the HIV-1 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag- pol amino acid 1209 and is ACT->CAT or amino acids D->A. Note: This vector is not in the pVR1012x/s backbone.

VRC4305

pVR1012 Gag-A(delFS)Pol(delta PR delta RT delta IN)/h

Eukaryotic vector with humanized codons expressing the Gag and the frame shifted Pol genes of HIV HIV-1A clade with deletions in the Protease, Reverse transcriptase, and Integrase regions. VRC4305 pVR1012 Gag(-AdelFS)Pol(delta PR delta RT delta IN)/h The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HIV-1 A clade (GenBank accession number AF004885) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HIV-1 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally

cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag- pol amino acid 1209 and is ACT->CAT or amino acids D->A. Note: This vector is not in the pVR1012x/s backbone.

pVRC4306

pVR1012 Gag(delFS)Pol delta PR delta RT delta IN/Nef/h

The protein sequence of the Gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the Gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic Gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic Gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the Gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic Gag gene was ligated in frame with sequences encoding the Pol polyprotein. The protein sequence of the Pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the Pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the Gag-Pol

polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of Gag plus an additional 3 amino acids from Pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all Gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. The Protease (PR) mutation is at Gag-Pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at Gag-Pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at Gag- Pol amino acid 1209 and is ACT->CAT or amino acids D->A. The Nef/h gene was fused to downstream of Pol gene of Gag(delFS)Pol(delta PR delta RT delta IN). No loss or extra-amino acid was created by the fusion between Nef and Pol. The ATG of Nef was preserved.The protein sequence of the Nef protein from HIV-1 PV22 (GenBank accession number K02083) was used to create a synthetic version of the Nef gene (Nef/h) using codons optimized for expression in human cells. The nucleotide sequence Nef/h shows little homology to the viral gene, but the protein encoded is the same. Note: This vector is not in the pVR1012x/s backbone.

VRC 4308

VRC4302-myr

pVR1012 Gag (delFS) Pol deltaPR deltaRT deltaIN deltaMyr/h

The myristoylation site was deleted from pVRC4302. The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons

optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. The myristylation site was deleted. Note:This vector is not in the pVR1012x/s backbone.

VRC 4309

pVR1012 Gag (delFS) Pol deltaPR deltaRT deltaIN delta Myr/Nef/h

The myristoylation site was deleted from pVRC4306. The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank

accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. The stop codon TAG was removed and synthetic B clade Nef (Genbank access number) was fusion to the 3' end of pol by PCR. Note: This vector is not in the pVR1012x/s backbone.

VRC 4310

pVR1012 Nef Gag (del fs) (del Myr) Pol (delta PR delta RT delta IN)/h

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector

backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. The stop codon TAG of synthetic B clade Nef (Genbank access number) gene was removed and was fused to the 5' end of gene gene by PCR.Note: This vector is not in the pVR1012x/s backbone.

VRC 4311

pVR1012 Gag-C(delFS)Pol(delta PR delta RT delta IN) Nef/h
VRC4304 + Clade C Nef

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HIV-1 C clade(GenBank accession number U52953) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HIV-1 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN)

mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. The stop codon TAG was removed and synthetic C clade Nef (Genbank accession number:U52953) was fusion to the 3' end of pol by PCR. Note:This vector is not in the pVR1012x/s backbone.

5

VRC 4312

Gag (del fs) (del Myr) Nef Pol ΔPRΔRTΔIN/h

VRC-Myr-gag-Dnef-Dpol

(Eukaryotic vector with humanized codons expressing the Gag, truncated Nef, and truncated Pol proteins of HIV subtype B .ns.)

This construct was derived from VRC4302. The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HXB2 (GenBank accession number K03455) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HXB2 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding synthetic nef gene that 51 aa were deleted from 5'. 77 aa were deleted from 5' of pol polyprotein, and ligated with 3' of nef in which tag stop codon was deleted . The protein sequence of the pol polyprotein (amino acids 3-78 - 1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG-

>GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. Note: This vector is not in the pVR1012x/s backbone.

VRC 4313

pVR1012 Gag Clade A (del fs)Pol(Δ PR Δ RT Δ IN)/h
VRC4305+ Clade A Nef

The protein sequence of the gag polyprotein (Pr55, amino acids 1-432) from HIV-1 A clade (GenBank accession number AF004885) was used to create a synthetic version of the gag gene using codons optimized for expression in human cells. The nucleotide sequence of the synthetic gag gene shows little homology to the HIV-1 gene, but the protein encoded is the same. The synthetic gag gene contains all of the mature Gag proteins except for the last two that are normally cleaved from the carboxy-terminus of the gag polyprotein, p1 and p6 (amino acids 433-500). The synthetic gag gene was ligated in frame with sequences encoding the pol polyprotein. The protein sequence of the pol polyprotein (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) was used to create a synthetic version of the pol gene (Pol/h) using codons optimized for expression in human cells. To create the possibility for translational frameshifting as means to express the gag-pol polyprotein, the synthetic coding region for the last four amino acids of the NC protein through the rest of gag plus an additional 3 amino acids from pol were replaced with the corresponding viral sequences (nucleotides 2074-2302 on the HXB2 genome) from NL4-3 (GenBank accession number M19921). The substitution of viral for synthetic sequences both introduces the sites required for frameshifting and restores the ability to express all gag proteins, including p1 and p6. The deleted Frame Shifted (delFS) has 5 T nucleotides deleted between the Gag and Pol sequences. Gag(fs)Pol/h is expressed from the pVR1012x/s vector backbone. The Protease (PR) mutation is at gag-pol amino acid 553 and is AGG->GGC or amino acids R->G. The Reverse Transcriptase (RT) mutation is at gag-pol amino acid 771 and is GAC->CAC or amino acids D->H. The Integrase (IN) mutation is at gag-pol amino acid 1209 and is ACT->CAT or amino acids D->A. The stop codon TAG was removed and synthetic A clade Nef (Genbank accession

number:AF069670) was fused to the 3' end of pol by PCR. Note: This vector is not in the pVR1012x/s backbone.

Examples

Env

Immunogens

Plasmids expressing the CXCR4-tropic HIV-1 HXB2 Env were made synthetically with sequences designed to disrupt viral RNA structures that limit protein expression by using codons typically found in human cells. Briefly, the synthetic Env gene of HXB2 (GenBank accession number K03455) was generated in three fragments by assembling the overlapping synthetic oligonucleotides using PCR amplification. To produce a CCR5-tropic version of the HIV-1 envelope, the region encoding amino acids 275 to 361 of HXB2 (CXCR4-tropic) gp160 was replaced with CCR5-tropic HIV-1 BaL sequence (GenBank accession number M68893), which includes the V3 loop. Glycosylation mutants were generated by site-directed mutagenesis to replace asparagine with glutamic acid residues at seventeen conserved glycosylation sites between amino acids 88 and 448. To express truncation mutant Env proteins, stop codons were introduced after positions 752, 704, 680 or 592 to produce gp150, gp145, gp140, or gp128, respectively. The Env protein was further changed by deleting amino acids 503 to 537 and 593 to 619, which removes the cleavage site sequence, the fusion domain, and a part of the spacer between the two heptad repeats. The structures of the synthetic HIV envelope genes are shown (Fig. I). The cDNAs were cloned in the expression vector pNGVL or pVR1012 under the control of the cytomegalovirus immediate-early enhancer, promoter, and first intron. The protein sequence was identical to HXB2 Env except for the following amino acid substitutions: F53L, N94D, K192S, I215N, A224T, A346D, P470L, T723I, and S745T.

Expression of Envelope Proteins in Transfected Cells

293 cells (10^6) were plated in 60mm dishes. Cells were transfected on the following day with 2 μg of plasmid using calcium phosphate (Graham FL, van der Eb AJ, 1973, Virology, 52:456-67). Cells were harvested 48 hours after transfection and lysed in buffer containing 50mM HEPES pH 7.0, 250mM NaCl and 0.5% NP40. The protein concentration in the lysates was determined using the Bradford reagent (Bio-Rad). Proteins (25 μg) in lysates were separated by 7.5% SDS-PAGE

and transferred to Immobilon-P membrane (Millipore, Bedford, MA). Env was detected by immunoprecipitation followed by Western blotting using polyclonal antibody against gp160 (Intracel, Rockville, MD).

Cell Surface Expression of Envelope by FACS Analysis

293 cells were harvested 48 hours after transfection and washed twice with phosphate-buffered saline (PBS) containing 1% bovine serum albumin and incubated for 30 minutes on ice with polyclonal immunoglobulin from an HIV-1 infected patient. The secondary antibody against human IgG conjugated with FITC (Jackson Immuno Research) was added, incubated for 30 minutes on ice, washed 3 times with PBS, and analyzed by flow cytometry (FACScan). The median fluorescent intensity values were derived using Cell Quant software.

DNA Injection in Mice

Six week old, female BALB/c mice were injected intramuscularly with 100 μg of purified plasmid DNA suspended in 200 μl of normal saline. For each plasmid DNA, a group of 4 mice was injected three times at intervals of two weeks. The mice were bled two weeks after the last injection, sera collected and stored at 4°C.

Quantitation of the Antibody Response

Immunoprecipitation and Western blotting was used to detect the antibodies that bind to native envelope proteins. Sera from immunized mice were used to immunoprecipitate gp160 from cell lysates of gp160-transfected 293 cells. Indicated dilutions were used to immunoprecipitate gp160 from the cell lysate (400 μg). Immunocomplexes were separated by 7.5% SDS-PAGE and analyzed by immunoblotting using the polyclonal antibody against gp160.

Analysis of CTL Response

Spleens were removed aseptically and gently homogenized to a single cell suspension, washed, and resuspended to a final concentration of $5x10^7$ cells/ml. Cells were incubated for 7 days in presence of IL-2 (10 U/ml) and either irradiated peptide-pulsed splenocytes from naive mice or an irradiated stable cell line expressing the full length gp160 *BC-env/rev,* (Irwin MJ et al., 1994, J Virol, **68**:5036-44). Three types of target cells were used: peptide-pulsed P815 cells (ATCC TIB64), BC10ME cells stably expressing gp160, and BC10ME cells (Collins JL, Patek PQ, Cohn M. Tumorigenicity and lysis by natural killers. *J Exp Med*, 1981; **153**:89-106) pulsed with peptides derived from gp160 sequence. Target

cells were labeled with ^{51}Cr for 90 minutes and washed three times with RPMI-1640 with 10% FBS, 2mM glutamine, $5x10^{-5}M$ β-mercaptoethanol and fungisone, 250units/ml, and resuspended in this media. Cytolytic activity was determined in triplicate samples using all different target cell dilutions in a 5-hour ^{51}Cr-release assay (Ohno T et al., 1997, Gene Ther, 4:361-6).

Gag and Pol

Development of Synthetic HIV-1 Gag-Pol Expression Vectors

The protein sequences of Gag (amino acids 1-432) from HXB2 (GenBank accession number K03455) and Pol (amino acids 3-1003) from NL4-3 (GenBank accession number M19921) were reverse translated by the GCG Package (Genetic Computer Group, Inc., Madison, WI) using codons expected for human cells. A 226-bp fragment spanning the frame shift site and the overlapping region of the two reading frames from NL4-3 were retained to allow expression of Gag and Gag-Pol precursor polyproteins in the same construct. 86 oligonucleotides covering 4325 DNA base pairs with 5' SalI and 3' EcoRI sites were purchased from GIBCO Life Technologies. Each of the oligonucleotides was 75 base-pairs with 25 nt of overlap. The codon optimized Gag-Pol gene (hGag-Pol) was assembled by PCR with Pwo (Boehringer Mannheim) and Turbo Pfu (Stratagene) high fidelity DNA polymerase. The PCR conditions were optimized with a PCR optimization kit (Stratagene) on a gradient Robocycler (Stratagene). Full-length synthetic Gag-Pol gene was cloned into the Sal I and blunted Bgl II site of the mammalian expression vector pNGVL-3 (Xu, Ling et al., 1998, Nature Medicine, 4:37-42) and confirmed by DNA sequencing. Three additional constructs were derived from the hGag-Pol gene. 5 Thymidines (Ts) in the frame shift site (FS) of the hGag-Pol gene were deleted (ΔFS) and the protease was inactivated by replacing AGG in protease to GGC (R42G) to create hGag-PolΔFSΔPr (Hung, M, 1998, J Virol, 72:4819-4824; Loeb, DD et al., 1989, Nature 340:397-400). 432 amino acids of the NH2- terminal of hGag-Pol gene were deleted and an ATG start codon was added to create the hPol gene. 925 amino acids of the COOH-terminal hGag-Pol were deleted to create the hGag gene. hGagPolΔFSΔPr, hPol and hGag genes were expressed in the pNGVL-3 plasmid, derived by insertion of a polylinker into pVR1012. The plasmid expressing viral Gag-Pol, pCMVΔ8.2 was a kind gift (Naldini, L et al., 1996, Science, 272:263-267).

Transient Transfection and Analysis of Expression

293T cells were maintained in Dulbecco's modified Eagle medium (DMEM; GIBCO-BRL), supplemented with 10% fetal bovine serum (FBS). Plasmid DNAs were purified with double cesium chloride sedimentation gradients. Approximately 3×10^6 293T cells were placed in a 10-cm dish one day before transfection. 10 μg of pCMVdR8.2 plasmid (containing the viral gag-pol gene), or 5 μg of pVR1012s (containing the codon altered genes), were used to transfect 293T cells, using the calcium phosphate method (Chen, C and H Okayama, 1987, Mol. Cell. Biol, 7:2745-2752). Three days after transfection, cell lysates were prepared with RIPA buffer (Boehringer Mannheim, Indianapolis, IN) and separated by 4-15% gradient SDS-polyacrylamide gel electrophoresis (PAGE), then transferred onto an Immobilon P membrane (Millipore). Membranes were then incubated with anti HIV-1-IgG (AIDS Research and Reference Reagent Program), monoclonal anti-p24 (ICN), or rabbit anti-RT (Intracel, Rockville, MD). Bands were visualized using the ECL Western blotting detection reagent (Amersham Pharmacia Biotech, Piscataway, NJ), as described by the manufacturer. Expression levels were determined using a phosphorimager.

Generation of Stably Transfected Cell Lines

hGag and hPol genes were individually subcloned into the Xho I and EcoRI sites of a retroviral vector, pPGS-CITE-Neo. Three plasmid systems were used to produce recombinant retroviruses containing the hGag or hPol genes (Yang, Z et al., 1998, Science, **279**:1034-1037). 48 hours after transfection, the supernatants were collected to transduce CT26 and BC10ME (Collins, JL, 1981, J Exp. Med, **153**:89-106) which are syngeneic to Balb/C mice, and selected in 0.8 mg/ml of G418 two days after infection. The positive clones were screened and confirmed by Western blotting and maintained in 10% FCS supplemented RPMI (GIBCO-BRL) with 0.5mg/ml G418.

DNA Vaccination of Mice

Female BALB/C mice, 6-8 weeks old, were used for immunogenicity studies. For DNA vaccination, mice were immunized with 100 μl (0.5 μg/ml DNA , 0.9% NaCl) in the quadriceps muscle of each hind leg every two weeks for a total of 4 injections.

CTL Assay

Animals were sacrificed after the last immunization and spleens removed from both naïve and immunized mice using aseptic techniques. Splenic lymphocytes were harvested and the chromium release CTL assay was performed in triplicate as previously described (Ohno, T. et al., 1997, Gene Ther, 4:361-366). The peptides used for sensitizing cells are as follows: Two peptide mixtures from the Gag protein P17(88-115) and p24(62-76). Seven peptide mixtures from the Pol protein: 1) P66(175-189), 2) P66(179-193), 3) P66(183-197), 4) P66(187-201), 5) P66(223-237), 6) P66(227-241), 7) P66(367-381).

Measurement of Antibody Responses

Anti-p24 ELISA assays

The anti-p24 ELISA assay was performed in Immunlon ninety-six-well plates (Dynet Technologies Inc., Chantilly, VA). The plates were coated with 50 µl of purified recombinant HIV-1IIIB p24 antigen (Intracel) at a concentration of 2 µg/ml in PBS buffer, pH 7.4 (GIBCO) with 0.05% sodium azide. Plates were washed 3x in PBS containing 3% BSA and 0.05% Tween20 (blocking buffer) and incubated for 2 hours. Mouse sera were serially diluted from 1:100 to 1:12,800 in blocking buffer, added to the p24-coated plates and incubated overnight at 4°C. Plates were then washed four times with PBS (0.05% Tween 20), and incubated with goat anti-mouse IgG (1:10,000 dilution, Sigma) for 2 hours at room temperature. Plates were washed four times, and then pNPP alkaline phosphatase substrate (75 µl; Sigma, St. Louis, MO) was added to each well. The reaction was stopped after one hour by addition of 0.5 N NaOH (25 µl). The plates were read on an ELISA reader at 405 nm, and titers were calculated at a cutoff optical density of 0.4.

HIV-1 immunoblotting

The strips containing HIV-1 proteins (Immunectics Inc., Cambridge, MA) were incubated with pooled mouse sera at a dilution of 1:25. Purified human anti-HIV IgG (AIDS Research and Reference Reagent Program, Rockville, MD) was used as a positive control. Bands were visualized using the ECL Western blotting detection reagent (Amersham Pharmacia Biotech, Piscataway, NJ).

Immunoprecipitation and Western blotting

Three days after transfection, hPol gene-transfected 293T cell lysates were prepared with RIPA buffer. The pooled mouse sera were diluted with immunoprecipitation (IP) buffer (100mM KCl, 2.5mM $MgCl_2$, 20mM HEPES, pH

7.9, 0.1% NP-40, 1mM DTT and proteinase inhibitors). After adding 10 μg of the cell lysate containing the HIV-1 Pol protein, the reactions were incubated overnight on a rotator at 4°C. 250 μl of Protein G and A Sepharose beads (10%V/V in IP buffer) were then added, and the reactions were incubated for 2 hours on a rotator at 4°C. The beads were washed four times with IP buffer, resuspended in 30 μl of 1X sample buffer and loaded onto SDS-PAGE. After transfer onto an Immobilon P membrane (Millipore), membranes were incubated with anti HIV-1-IgG (AIDS Research and Reference Reagent Program). Bands were visualized using the ECL Western blotting detection reagent (Amersham Pharmacia Biotech).

Prime/Boost Vaccination Strategy

Groups of guinea pigs (4/group) were immunized (primed) with the vectors listed below, 3 times at 2 week intervals. Two weeks after the third DNA immunization, blood was collected for immune analysis. 2-3 days after the blood collection, the animals received a boost with a corresponding adenoviral construct, AdApt (Sullivan, N. et al., 2000, Nature, 408:605-608). Blood was again collected 2 weeks after the adenoviral boost. Blood was tested for neutralizing antibodies and (using an ELISA) the presence of antibody against the envelope. The groups are summarized below.

Prime	Adenoviral Boost
gp140delCFI (R5)	Adv gp140delCFI(R5)
gp145delCFI (R5)	Adv gp145delCFI(R5)
gp145delCFI (R5)	Adv gp140delCFI(R5)
gp140delCFI (89.6P)	Adv gp140delCFI(89.6P)
gp145delCFI (89.6P)	Adv gp145delCFI(89.6P)
gp145delCFI (89.6P)	Adv gp140delCFI(89.6P)
Adv gp140delCFI (R5)	Adv gp140delCFI(R5)
Adv gp145delCFI (R5)	Adv gp145delCFI(R5)
Adv gp145delCFI (R5)	Adv gp140delCFI(R5)
Adv gp140delCFI (89.6P)	Adv gp140delCFI(89.6P)
Adv gp145delCFI (89.6P)	Adv gp145delCFI(89.6P)
Adv gp145delCFI (89.6P)	Adv gp140delCFI(89.6P)

Results

The level of antibody in the sera after adenoviral boost was 8- to10-fold higher than the level of antibody present after 3 injections of DNA alone, in almost all of the cases. Neutralizing antibodies were detected in the sera of animals immunized with either gp145delCFI DNA or gp140delCFI DNA followed by Advgp140delCFI.

Neutralization was also observed in animals immunized with gp145delCFI DNA followed by Adv gp145delCFI, and in animals both primed and boosted with adenovirus.

Optimal neutralization was seen when animals were primed with gp145delCFI DNA followed by adenovirus expressing gp140delCFI in both clade B (R5-Bal strain) and 89.6P (Clade B, dual tropic strain).

All neutralizing activity was able to be blocked with the V3 peptide of the corresponding strains.

*****

While the present invention has been described in some detail for purposes of clarity and understanding, one skilled in the art will appreciate that various changes in form and detail can be made without departing from the true scope of the invention. All figures, tables, and appendices, as well as patents, applications and publications referred to above are hereby incorporated by reference.

WHAT IS CLAIMED IS:

1. A nucleic acid molecule comprising a polynucleotide encoding a modified glycosylation or ΔCFI HIV Env, or combination thereof, encoding a plasmid taken from Table 1 (or its modified HIV Env insert), or encoding an analog of said plasmid or insert having at least 95% identity thereto.

2. The nucleic acid molecule of Claim 1 which is plasmid 2100 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

3. The nucleic acid molecule of Claim 1 which is plasmid 2200 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

4. The nucleic acid molecule of Claim 1 which is plasmid 2300 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

5. The nucleic acid molecule of Claim 1 which is plasmid 2302 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

6. The nucleic acid molecule of Claim 1 which is plasmid 2400 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

7. The nucleic acid molecule of Claim 1 which is plasmid 2700 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

8. The nucleic acid molecule of Claim 1 which is plasmid 2701 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

9. The nucleic acid molecule of Claim 1 which is plasmid 2702 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

10. The nucleic acid molecule of Claim 1 which is plasmid 2706 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

11. The nucleic acid molecule of Claim 1 which is plasmid 2707 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

12. The nucleic acid molecule of Claim 1 which is plasmid 2800 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

13. The nucleic acid molecule of Claim 1 which is plasmid 2801 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

14. The nucleic acid molecule of Claim 1 which is plasmid 2804 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

15. The nucleic acid molecule of Claim 1 which is plasmid 2805 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

16. The nucleic acid molecule of Claim 1 which is plasmid 2810 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

17. The nucleic acid molecule of Claim 1 which is plasmid 2811 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

18. The nucleic acid molecule of Claim 1 which is plasmid 2812 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

19. The nucleic acid molecule of Claim 1 which is plasmid 2813 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

20. The nucleic acid molecule of Claim 1 which is plasmid 2814 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

21. The nucleic acid molecule of Claim 1 which is plasmid 2820 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

22. The nucleic acid molecule of Claim 1 which is plasmid 2821 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

23. The nucleic acid molecule of Claim 1 which is plasmid 2822 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

24. The nucleic acid molecule of Claim 1 which is plasmid 2823 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

25. The nucleic acid molecule of Claim 1 which is plasmid 2824 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

26. The nucleic acid molecule of Claim 1 which is plasmid 2825 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

27. The nucleic acid molecule of Claim 1 which is plasmid 2826 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

28. The nucleic acid molecule of Claim 1 which is plasmid 2827 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

29. The nucleic acid molecule of Claim 1 which is plasmid 2828 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

30. The nucleic acid molecule of Claim 1 which is plasmid 2829 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

31. The nucleic acid molecule of Claim 1 which is plasmid 2830 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

32. The nucleic acid molecule of Claim 1 which is plasmid 2831 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

33. The nucleic acid molecule of Claim 1 which is plasmid 2832 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

34. The nucleic acid molecule of Claim 1 which is plasmid 2833 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

35. The nucleic acid molecule of Claim 1 which is plasmid 2834 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

36. The nucleic acid molecule of Claim 1 which is plasmid 2835 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

37. The nucleic acid molecule of Claim 1 which is plasmid 2836 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

38. The nucleic acid molecule of Claim 1 which is plasmid 2837 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

39. The nucleic acid molecule of Claim 1 which is plasmid 2838 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

40. The nucleic acid molecule of Claim 1 which is plasmid 2839 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

41. The nucleic acid molecule of Claim 1 which is plasmid 2840 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

42. The nucleic acid molecule of Claim 1 which is plasmid 2841 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

43. The nucleic acid molecule of Claim 1 which is plasmid 2842 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

44. The nucleic acid molecule of Claim 1 which is plasmid 2843 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

45. The nucleic acid molecule of Claim 1 which is plasmid 2844 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

46. The nucleic acid molecule of Claim 1 which is plasmid 2845 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

47. The nucleic acid molecule of Claim 1 which is plasmid 2846 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

48. The nucleic acid molecule of Claim 1 which is plasmid 2847 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

49. The nucleic acid molecule of Claim 1 which is plasmid 2848 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

50. The nucleic acid molecule of Claim 1 which is plasmid 2849 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

51. The nucleic acid molecule of Claim 1 which is plasmid 2850 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

52. The nucleic acid molecule of Claim 1 which is plasmid 2851 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

53. The nucleic acid molecule of Claim 1 which is plasmid 2852 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

54. The nucleic acid molecule of Claim 1 which is plasmid 2853 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

55. The nucleic acid molecule of Claim 1 which is plasmid 2854 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

56. The nucleic acid molecule of Claim 1 which is plasmid 2860 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

57. The nucleic acid molecule of Claim 1 which is plasmid 2861 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

58. The nucleic acid molecule of Claim 1 which is plasmid 2862 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

59. The nucleic acid molecule of Claim 1 which is plasmid 2863 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

60. The nucleic acid molecule of Claim 1 which is plasmid 2864 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

61. The nucleic acid molecule of Claim 1 which is plasmid 2865 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

62. The nucleic acid molecule of Claim 1 which is plasmid 2866 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

63. The nucleic acid molecule of Claim 1 which is plasmid 2867 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

64. The nucleic acid molecule of Claim 1 which is plasmid 2868 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

65. The nucleic acid molecule of Claim 1 which is plasmid 2869 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

66. The nucleic acid molecule of Claim 1 which is plasmid 2870 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

67. The nucleic acid molecule of Claim 1 which is plasmid 2871 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

68. The nucleic acid molecule of Claim 1 which is plasmid 2872 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

69. The nucleic acid molecule of Claim 1 which is plasmid 2873 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

70. The nucleic acid molecule of Claim 1 which is plasmid 2874 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

71. The nucleic acid molecule of Claim 1 which is plasmid 2900 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

72. The nucleic acid molecule of Claim 1 which is plasmid 3000 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

73. The nucleic acid molecule of Claim 1 which is plasmid 3200 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

74. The nucleic acid molecule of Claim 1 which is plasmid 3201 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

75. The nucleic acid molecule of Claim 1 which is plasmid 3202 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

76. The nucleic acid molecule of Claim 1 which is plasmid 3203 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

77. The nucleic acid molecule of Claim 1 which is plasmid 3300 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

78. The nucleic acid molecule of Claim 1 which is plasmid 3301 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

79. The nucleic acid molecule of Claim 1 which is plasmid 3400 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

80. The nucleic acid molecule of Claim 1 which is plasmid 3401 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

81. The nucleic acid molecule of Claim 1 which is plasmid 3500 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

82. The nucleic acid molecule of Claim 1 which is plasmid 3600 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

83. The nucleic acid molecule of Claim 1 which is plasmid 3700 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

84. The nucleic acid molecule of Claim 1 which is plasmid 3800 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

85. The nucleic acid molecule of Claim 1 which is plasmid 5200 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

86. The nucleic acid molecule of Claim 1 which is plasmid 5201 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

87. The nucleic acid molecule of Claim 1 which is plasmid 5202 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

88. The nucleic acid molecule of Claim 1 which is plasmid 5203 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

89. The nucleic acid molecule of Claim 1 which is plasmid 5300 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

90. The nucleic acid molecule of Claim 1 which is plasmid 5301 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

91. The nucleic acid molecule of Claim 1 which is plasmid 5303 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

92. The nucleic acid molecule of Claim 1 which is plasmid 5304 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

93. The nucleic acid molecule of Claim 1 which is plasmid 5305 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

94. The nucleic acid molecule of Claim 1 which is plasmid 5306 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

95. The nucleic acid molecule of Claim 1 which is plasmid 5307 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

96. The nucleic acid molecule of Claim 1 which is plasmid 5308 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

97. The nucleic acid molecule of Claim 1 which is plasmid 5309 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

98. The nucleic acid molecule of Claim 1 which is plasmid 5350 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

99. The nucleic acid molecule of Claim 1 which is plasmid 5351 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

100. The nucleic acid molecule of Claim 1 which is plasmid 5352 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

101. The nucleic acid molecule of Claim 1 which is plasmid 5353 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

102. The nucleic acid molecule of Claim 1 which is plasmid 5354 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

103. The nucleic acid molecule of Claim 1 which is plasmid 5355 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

104. The nucleic acid molecule of Claim 1 which is plasmid 5356 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

105. The nucleic acid molecule of Claim 1 which is plasmid 5357 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

106. The nucleic acid molecule of Claim 1 which is plasmid 5358 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

107. The nucleic acid molecule of Claim 1 which is plasmid 5359 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

108. The nucleic acid molecule of Claim 1 which is plasmid 5360 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

109. The nucleic acid molecule of Claim 1 which is plasmid 5361 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

110. The nucleic acid molecule of Claim 1 which is plasmid 5362 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

111. The nucleic acid molecule of Claim 1 which is plasmid 5363 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

112. The nucleic acid molecule of Claim 1 which is plasmid 5364 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

113. The nucleic acid molecule of Claim 1 which is plasmid 5365 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

114. The nucleic acid molecule of Claim 1 which is plasmid 5366 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

115. The nucleic acid molecule of Claim 1 which is plasmid 5367 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

116. The nucleic acid molecule of Claim 1 which is plasmid 5368 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

117. The nucleic acid molecule of Claim 1 which is plasmid 5369 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

118. The nucleic acid molecule of Claim 1 which is plasmid 5370 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

119. The nucleic acid molecule of Claim 1 which is plasmid 5371 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

120. The nucleic acid molecule of Claim 1 which is plasmid 5372 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

121. The nucleic acid molecule of Claim 1 which is plasmid 5373 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

122. The nucleic acid molecule of Claim 1 which is plasmid 5374 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

123. The nucleic acid molecule of Claim 1 which is plasmid 5375 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

124. The nucleic acid molecule of Claim 1 which is plasmid 5376 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

125. The nucleic acid molecule of Claim 1 which is plasmid 5377 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

126. The nucleic acid molecule of Claim 1 which is plasmid 5378 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

127. The nucleic acid molecule of Claim 1 which is plasmid 5379 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

128. The nucleic acid molecule of Claim 1 which is plasmid 5500 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

129. The nucleic acid molecule of Claim 1 which is plasmid 5501 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

130. The nucleic acid molecule of Claim 1 which is plasmid 5502 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

131. The nucleic acid molecule of Claim 1 which is plasmid 5503 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

132. The nucleic acid molecule of Claim 1 which is plasmid 5504 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

133. The nucleic acid molecule of Claim 1 which is plasmid 5505 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

134. The nucleic acid molecule of Claim 1 which is plasmid 5506 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

135. The nucleic acid molecule of Claim 1 which is plasmid 5507 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

136. The nucleic acid molecule of Claim 1 which is plasmid 5508 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

137. The nucleic acid molecule of Claim 1 which is plasmid 5509 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

138. The nucleic acid molecule of Claim 1 which is plasmid 5510 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

139. The nucleic acid molecule of Claim 1 which is plasmid 5511 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

140. The nucleic acid molecule of Claim 1 which is plasmid 5512 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

141. The nucleic acid molecule of Claim 1 which is plasmid 5513 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

142. The nucleic acid molecule of Claim 1 which is plasmid 5514 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

143. The nucleic acid molecule of Claim 1 which is plasmid 5515 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

144. The nucleic acid molecule of Claim 1 which is plasmid 5516 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

145. The nucleic acid molecule of Claim 1 which is plasmid 5517 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

146. The nucleic acid molecule of Claim 1 which is plasmid 5518 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

147. The nucleic acid molecule of Claim 1 which is plasmid 5519 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

148. The nucleic acid molecule of Claim 1 which is plasmid 5520 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

149. The nucleic acid molecule of Claim 1 which is plasmid 5521 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

150. The nucleic acid molecule of Claim 1 which is plasmid 5522 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

151. The nucleic acid molecule of Claim 1 which is plasmid 5523 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

152. The nucleic acid molecule of Claim 1 which is plasmid 5524 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

153. The nucleic acid molecule of Claim 1 which is plasmid 5525 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

154. The nucleic acid molecule of Claim 1 which is plasmid 5526 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

155. The nucleic acid molecule of Claim 1 which is plasmid 5527 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

156. The nucleic acid molecule of Claim 1 which is plasmid 5528 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

157. The nucleic acid molecule of Claim 1 which is plasmid 5529 (or its modified HIV Env insert) or an analog of said plasmid or insert having at least 95% identity thereto.

158. A nucleic acid molecule comprising a polynucleotide encoding in a continuous open reading frame a modified HIV Gag-Pol or Gag-Pol-Nef fusion protein, encoding a plasmid taken from Table 1 (or its modified HIV Gag, Pol, or Nef insert), or encoding an analog of said plasmid or insert having at least 95% identity thereto.

159. The nucleic acid molecule of Claim 158 which is plasmid 3900 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

160. The nucleic acid molecule of Claim 158 which is plasmid 3901 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

161. The nucleic acid molecule of Claim 158 which is plasmid 4000 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

162. The nucleic acid molecule of Claim 158 which is plasmid 4001 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

163. The nucleic acid molecule of Claim 158 which is plasmid 4100 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

164. The nucleic acid molecule of Claim 158 which is plasmid 4101 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

165. The nucleic acid molecule of Claim 158 which is plasmid 4200 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

166. The nucleic acid molecule of Claim 158 which is plasmid 4300 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

167. The nucleic acid molecule of Claim 158 which is plasmid 4301 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

168. The nucleic acid molecule of Claim 158 which is plasmid 4302 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

169. The nucleic acid molecule of Claim 158 which is plasmid 4303 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

170. The nucleic acid molecule of Claim 158 which is plasmid 4304 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

171. The nucleic acid molecule of Claim 158 which is plasmid 4305 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

172. The nucleic acid molecule of Claim 158 which is plasmid 4306 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

173. The nucleic acid molecule of Claim 158 which is plasmid 4308 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

174. The nucleic acid molecule of Claim 158 which is plasmid 4309 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

175. The nucleic acid molecule of Claim 158 which is plasmid 4310 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

176. The nucleic acid molecule of Claim 158 which is plasmid 4311 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

177. The nucleic acid molecule of Claim 158 which is plasmid 4312 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

178. The nucleic acid molecule of Claim 158 which is plasmid 4313 (or its modified HIV Gag, Pol, or Nef insert) or an analog of said plasmid or insert having at least 95% identity thereto.

179. A modified HIV Env, Gag, Pol, or Nef encoded by the nucleic acid molecule of any of Claims 1-178.

180. The nucleic acid molecule of any of Claims 1-178 further comprising a backbone, wherein said backbone is a plasmid vector.

181. The nucleic acid molecule of any of Claims 1-178 further comprising a backbone, wherein said backbone is an adenoviral vector.

182. A nucleic acid molecule comprising a polynucleotide encoding a modified glycosylation or ΔCFI HIV Env, or combination thereof, encoding a modified HIV Env insert taken from a plasmid taken from Table 1, or encoding an analog of said insert having at least 95% identity thereto, and further encoding in a continuous open reading frame a modified HIV Gag-Pol or Gag-Pol-Nef fusion protein, encoding a modified HIV Gag, Pol, or Nef insert taken from a plasmid taken from Table 1, or encoding an analog of said insert having at least 95% identity thereto.

183. A pharmaceutical composition comprising at least one nucleic acid molecule of any of Claims 1-178 and a pharmaceutically acceptable solution in a therapeutically effective dose

184. A vaccine composition comprising at least one nucleic acid molecule of any of Claims 1-178 and a pharmaceutically acceptable solution in a prophylactically effective dose.

185. A pharmaceutical composition comprising at least one modified HIV Env, Gag, Pol, or Nef of Claim 179 and a pharmaceutically acceptable solution in a therapeutically effective dose.

186. A vaccine composition comprising at least one modified HIV Env, Gag, Pol, or Nef of Claim 179 and a pharmaceutically acceptable solution in a prophylactically effective dose.

187. The composition of any of Claims 183-186 additionally comprising an adjuvant.

188. The composition of Claim 187 wherein said adjuvant is a cytokine.

189. The composition of Claim 183 or 184 which combines plasmid 4306 (gag-pol-nef) and plasmid 2827 (env).

190. The composition of Claim 183 or 184 which combines plasmid 4306 (gag-pol-nef Clade B), plasmid 2827 (env Clade B), plasmid 4311 (gag-pol-nef Clade C), and plasmid 5509 (env Clade C).

191. A method comprising the step of administering by genetic immunization a nucleic acid molecule of any of Claims 1-178 to a host to ameliorate the symptoms of AIDS or HIV infection.

192. A method comprising the step of administering by genetic immunization a nucleic acid molecule of any of Claims 1-178 to a host to generate an antibody or CTL response against native HIV Env, Gag, Pol, or Nef.

193. A method comprising the step of administering by protein immunization a modified HIV Env, Gag, Pol, or Nef of Claim 179 to a host to ameliorate the symptoms of AIDS or HIV infection.

194. A method comprising the step of administering by protein immunization a modified HIV Env, Gag, Pol, or Nef of Claim 179 to a host to generate an antibody or CTL response against native HIV Env, Gag, Pol, or Nef.

195. The method of any of Claims 191-194 wherein said step is a primary immunization.

196. The method of any of Claims 191-194 wherein said step is a boost.

197. The method of Claims 191 or 192 wherein said step is a primary immunization with a plasmid vector.

198. The method of Claims 191 or 192 wherein said step is a boost with an adenoviral vector.

199. The method of Claims 191 or 192 wherein said step is a primary immunization with a plasmid vector expressing gp145delCFI and further comprising a step which is a boost with an adenoviral vector expressing gp140delCFI.

200. A nucleic acid molecule of any of Claims 1-178 for use by genetic immunization in amelioration of the symptoms of AIDS or HIV infection.

201. A nucleic acid molecule of any of Claims 1-178 for use by genetic immunization in generation of an antibody or CTL response against native HIV Env, Gag, Pol, or Nef.

202. A modified HIV Env, Gag, Pol, or Nef of Claim 179 for use by protein immunization in amelioration of the symptoms of AIDS or HIV infection.

203. A modified HIV Env, Gag, Pol, or Nef of Claim 179 for use by protein immunization in generation of an antibody or CTL response against native HIV Env, Gag, Pol, or Nef.

204. A nucleic acid molecule comprising a polynucleotide encoding a modified ΔCFI HIV Env or encoding in a continuous open reading frame a modified HIV Gag-Pol or Gag-Pol-Nef fusion protein, or a combination thereof, applied to any HIV clade or strain.

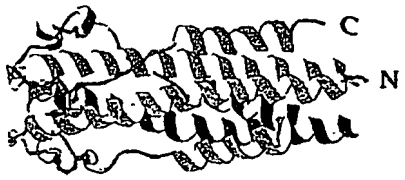
205. A nucleic acid molecule comprising a polynucleotide encoding a modified ΔCFI HIV Env or encoding in a continuous open reading frame a modified HIV Gag-Pol or Gag-Pol-Nef fusion protein, or a combination thereof, applied to related proteins of other viruses.

206. A nucleic acid molecule comprising a polynucleotide encoding a modified viral membrane fusion protein with deletions in sufficient domains to expose a core protein for optimal antigen presentation, wherein the viral membrane fusion protein is defined by a central triple stranded coiled coil followed by a disulfide-bonded loop that reverses the chain direction and connects to an α helix packed antiparallel to the core helices.

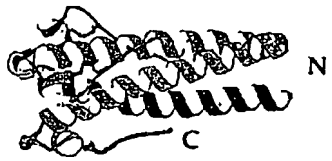
207. A nucleic acid molecule comprising a polynucleotide encoding in a continuous open reading frame a modified viral protein, wherein the viral protein is transcribed in native form by translational frame shifting in a non-equivalent ratio or through a separate open reading frame.

Figure A

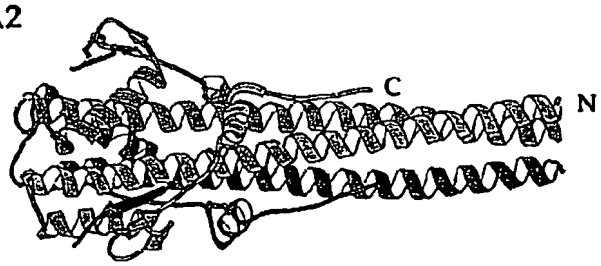
A Ebola GP2



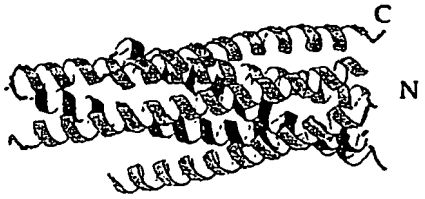
B MoMuLv Mo-55



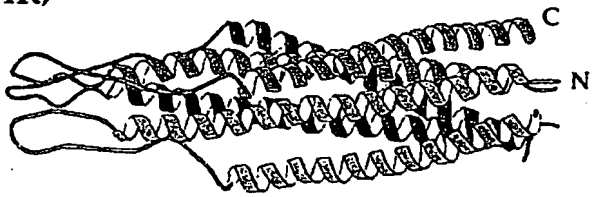
C low-pH-treated influenza HA2



D protease resistant core of HIV gp41



E SIV gp41 (NMR)



F SNAREs

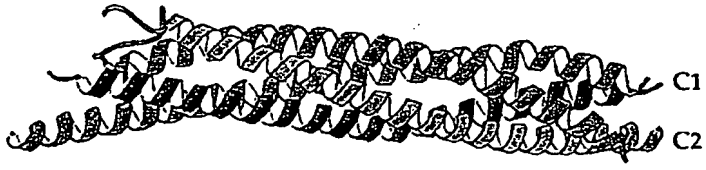


Figure I

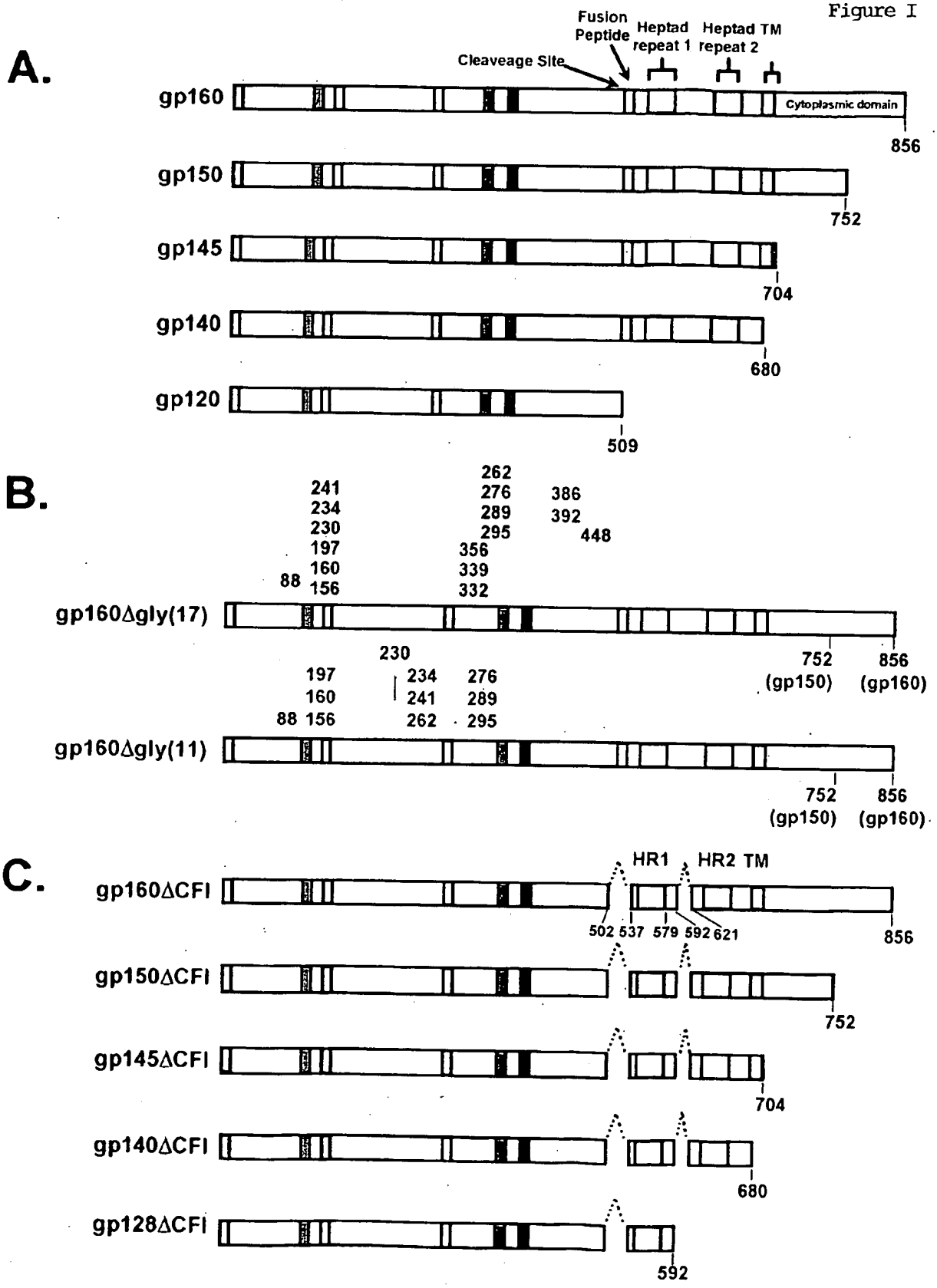

A.
Fusion Peptide
Heptad repeat 1
Heptad TM repeat 2
Cleaveage Site
gp160
Cytoplasmic domain
856
gp150
752
gp145
704
gp140
680
gp120
509
B.
241
234
230
197
160
88
156
262
276
289
295
356
339
332
386
392
448
gp160Δgly(17)
752 (gp150)
856 (gp160)
230
197
160
88 156
234
241
262
276
289
295
gp160Δgly(11)
752 (gp150)
856 (gp160)
C.
HR1
HR2 TM
gp160ΔCFI
502 537 579 592 621
856
gp150ΔCFI
752
gp145ΔCFI
704
gp140ΔCFI
680
gp128ΔCFI
592

Figure II

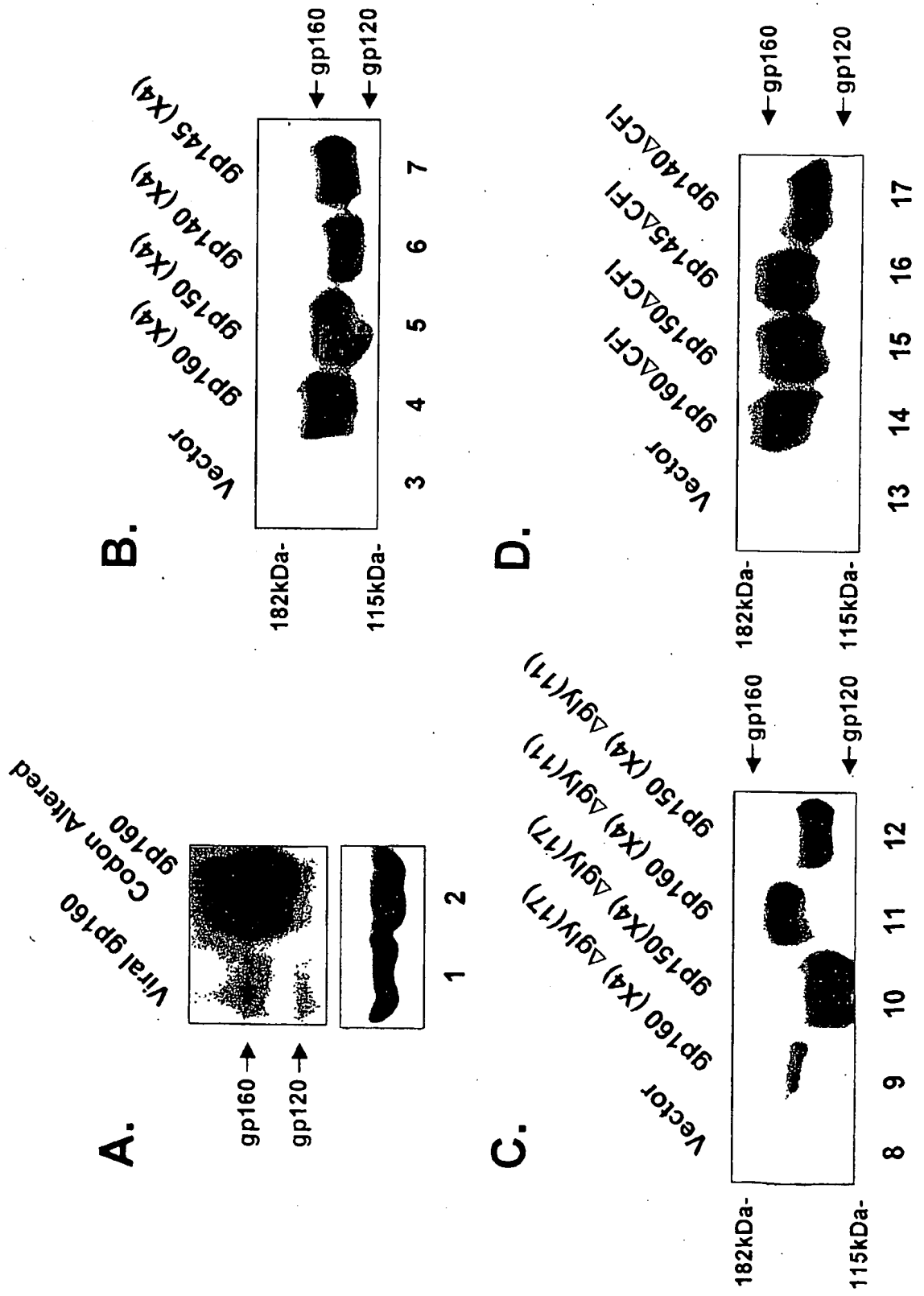

A.
Viral gp160
Codon Altered gp160
gp160
gp120
1 2
B.
Vector
gp160 (X4)
gp150 (X4)
gp140 (X4)
gp145 (X4)
gp160
gp120
182kDa-
115kDa-
3 4 5 6 7
C.
Vector
gp160 (X4) Δgly(17)
gp150(X4) Δgly(17)
gp160 (X4) Δgly(17)
gp150 (X4) Δgly(11)
gp160
gp120
182kDa-
115kDa-
8 9 10 11 12
D.
Vector
gp160ΔCFI
gp150ΔCFI
gp145ΔCFI
gp140ΔCFI
gp160
gp120
182kDa-
115kDa-
13 14 15 16 17

Figure III

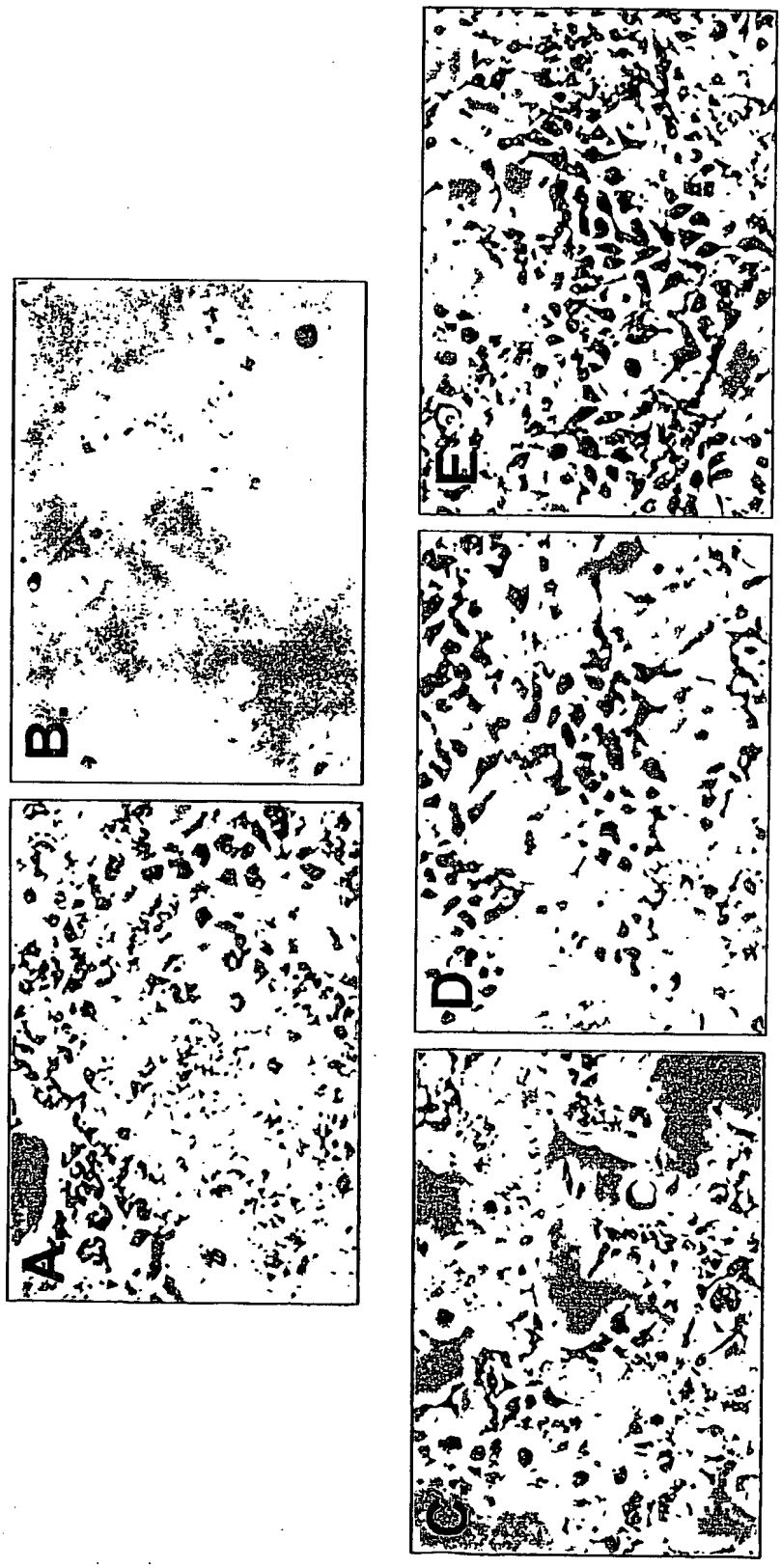


Figure IV

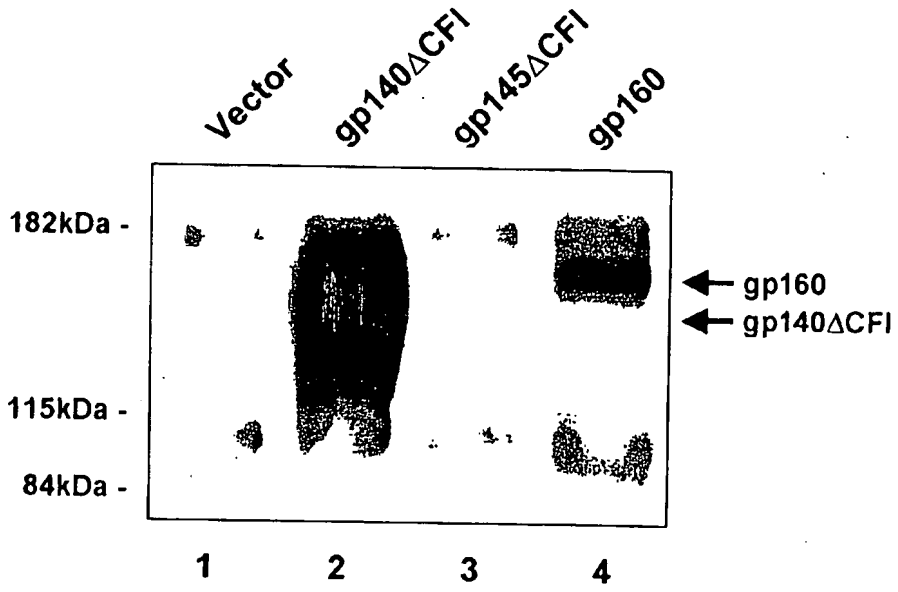
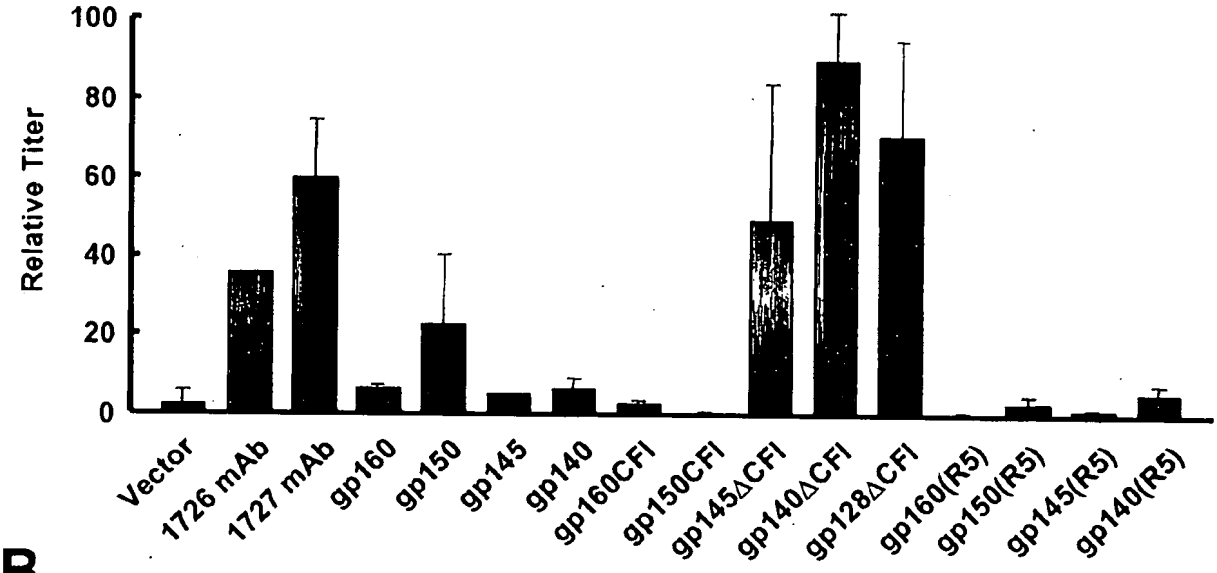
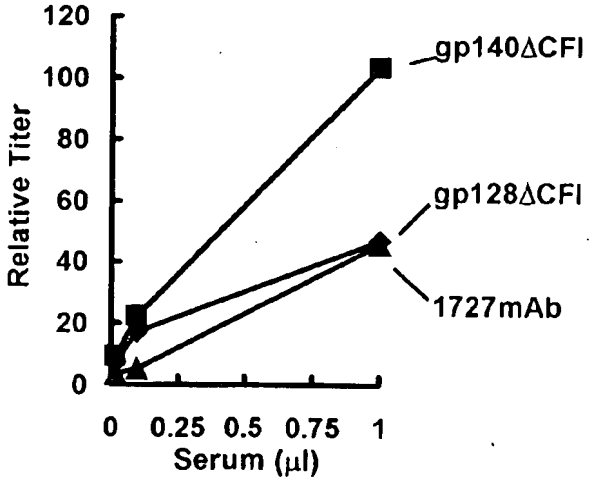

Vector
gp140ΔCFI
gp145ΔCFI
gp160
182kDa -
115kDa -
84kDa -
gp160
gp140ΔCFI
1
2
3
4

Figure V

A.


Relative Titer
100
80
60
40
20
0
Vector
1726 mAb
1727 mAb
gp160
gp150
gp145
gp140
gp160CFI
gp150CFI
gp145ΔCFI
gp140ΔCFI
gp128ΔCFI
gp160(R5)
gp150(R5)
gp145(R5)
gp140(R5)

B.


Relative Titer
120
100
80
60
40
20
0
gp140ΔCFI
gp128ΔCFI
1727mAb
0 0.25 0.5 0.75 1
Serum (μl)

C.

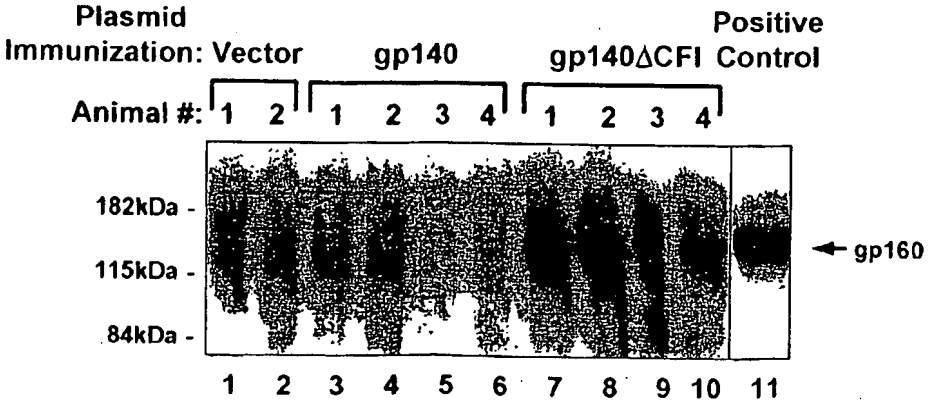

Plasmid
Immunization: Vector
gp140
gp140ΔCFI
Positive Control
Animal #: 1 2 1 2 3 4 1 2 3 4
182kDa -
115kDa -
84kDa -
gp160
1 2 3 4 5 6 7 8 9 10 11

Figure VI

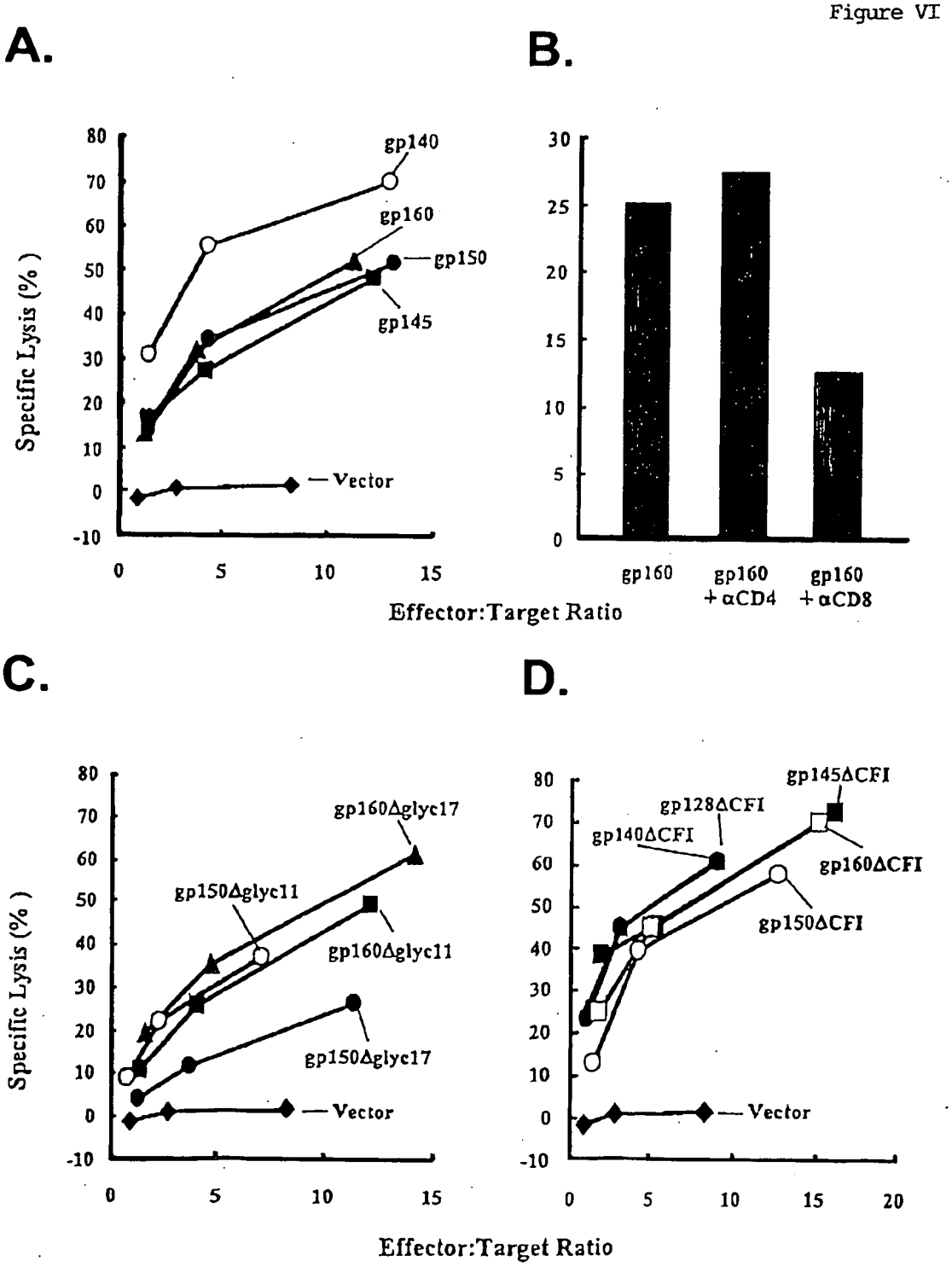

A.
B.
C.
D.
Specific Lysis (%)
gp140
gp160
gp150
gp145
Vector
Effector:Target Ratio
gp160
gp160 +αCD4
gp160 +αCD8
gp160Δglyc17
gp150Δglyc11
gp160Δglyc11
gp150Δglyc17
gp145ΔCFI
gp128ΔCFI
gp140ΔCFI
gp160ΔCFI
gp150ΔCFI

Figure VII

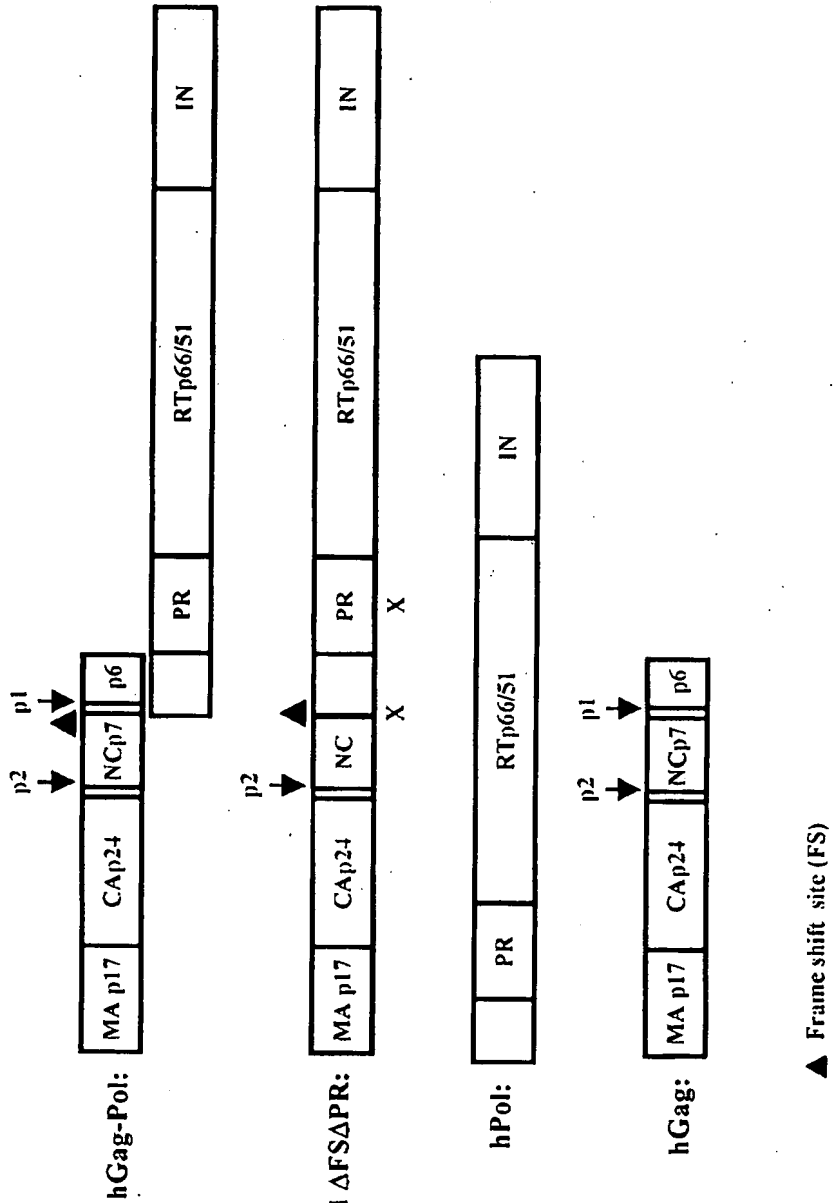

hGag-Pol:
MA p17
CAp24
NCp7
p6
PR
RTp66/51
IN
p1
p2
hGag-Pol ΔFSΔPR:
MA p17
CAp24
NC
PR
RTp66/51
IN
X
X
hPol:
PR
RTp66/51
IN
hGag:
MA p17
CAp24
NCp7
p6
p1
p2
Frame shift site (FS)

Figure VIII

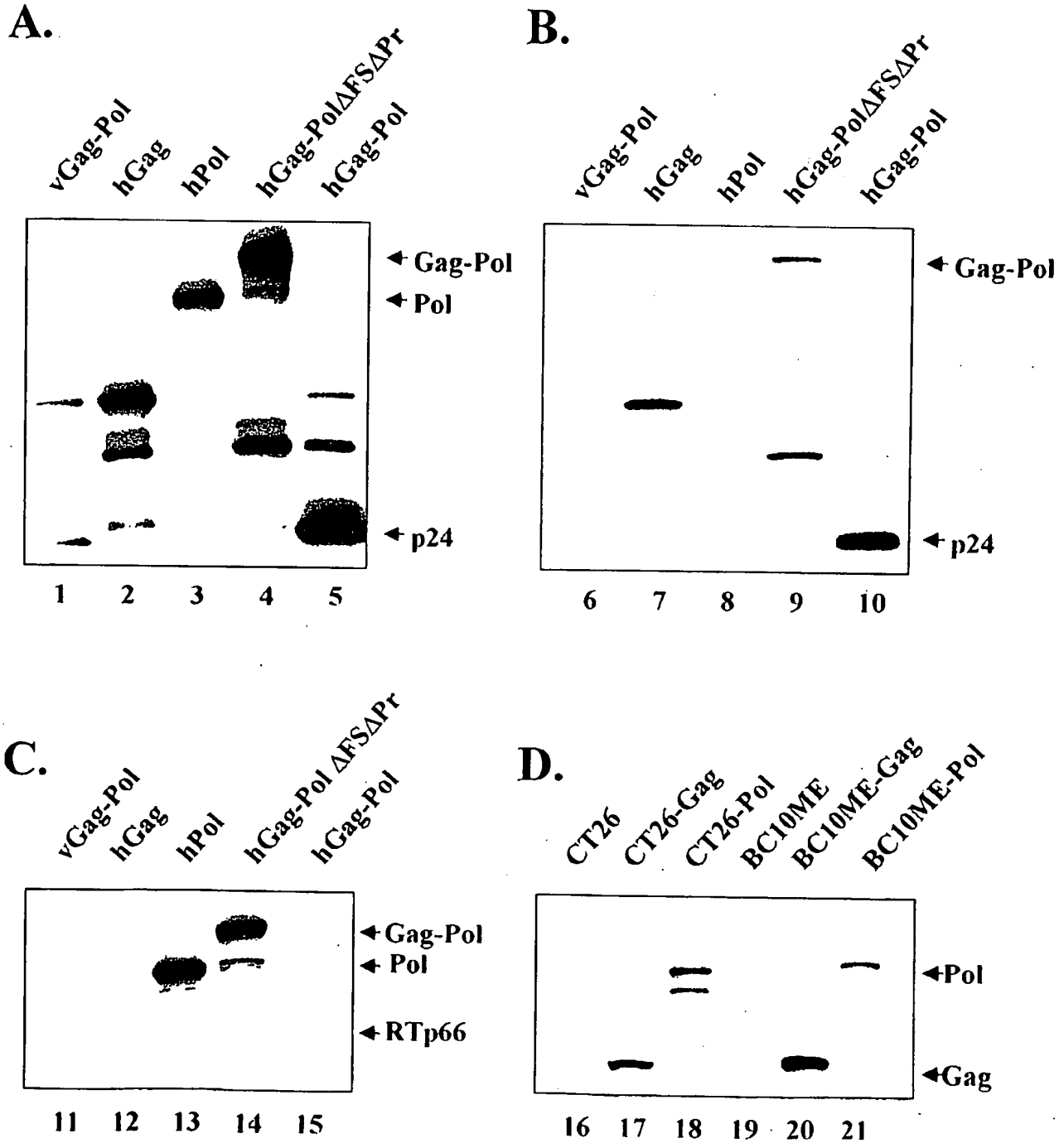

A.
vGag-Pol
hGag
hPol
hGag-PolΔFSΔPr
hGag-Pol
Gag-Pol
Pol
p24
1 2 3 4 5
B.
vGag-Pol
hGag
hPol
hGag-PolΔFSΔPr
hGag-Pol
Gag-Pol
p24
6 7 8 9 10
C.
vGag-Pol
hGag
hPol
hGag-Pol ΔFSΔPr
hGag-Pol
Gag-Pol
Pol
RTp66
11 12 13 14 15
D.
CT26
CT26-Gag
CT26-Pol
BC10ME
BC10ME-Gag
BC10ME-Pol
Pol
Gag
16 17 18 19 20 21

Figure IX

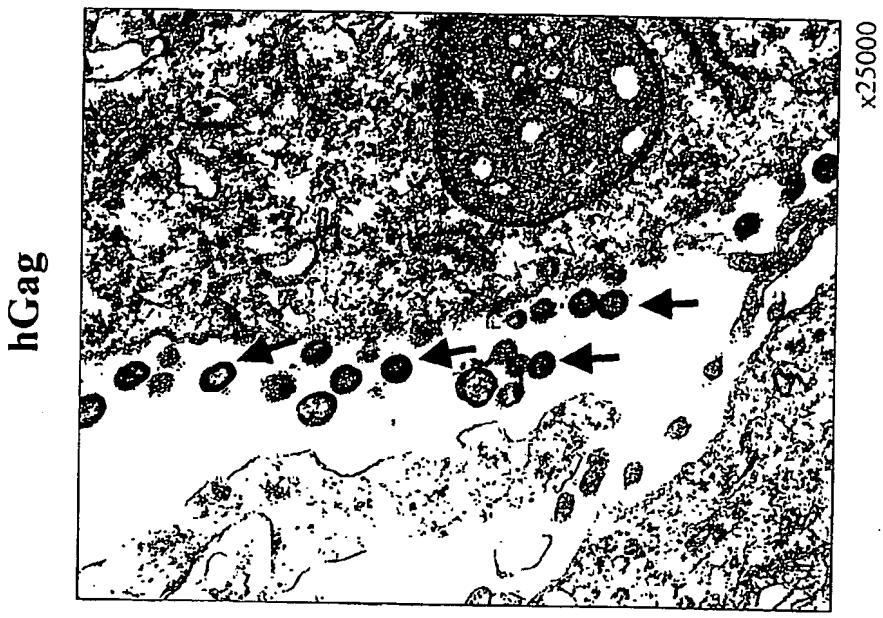


Figure X

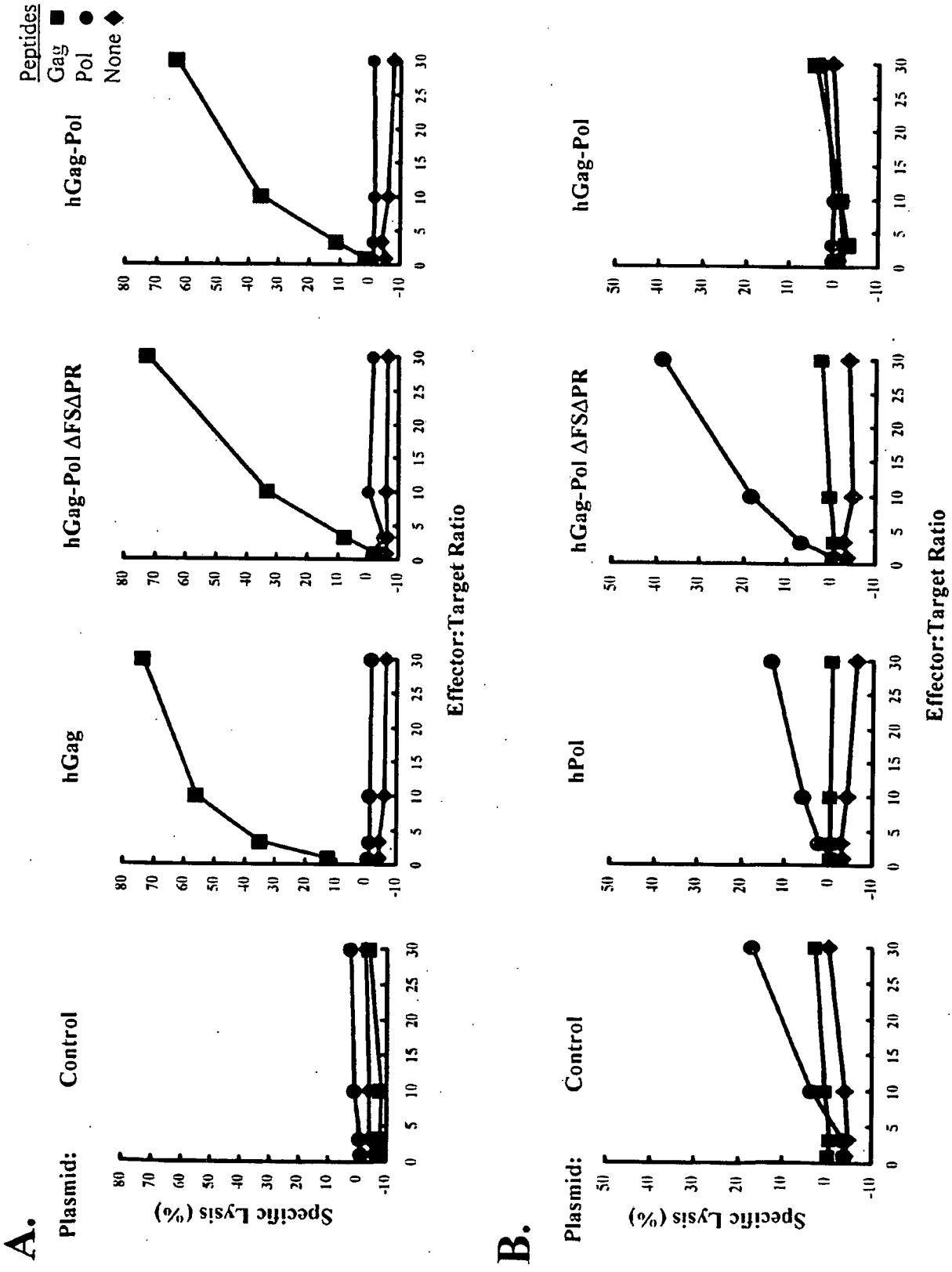
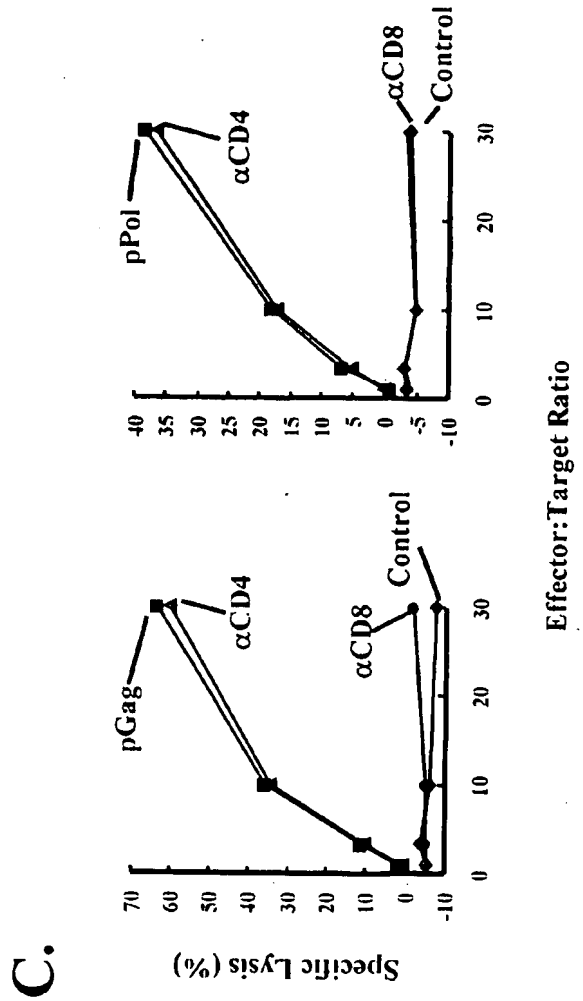
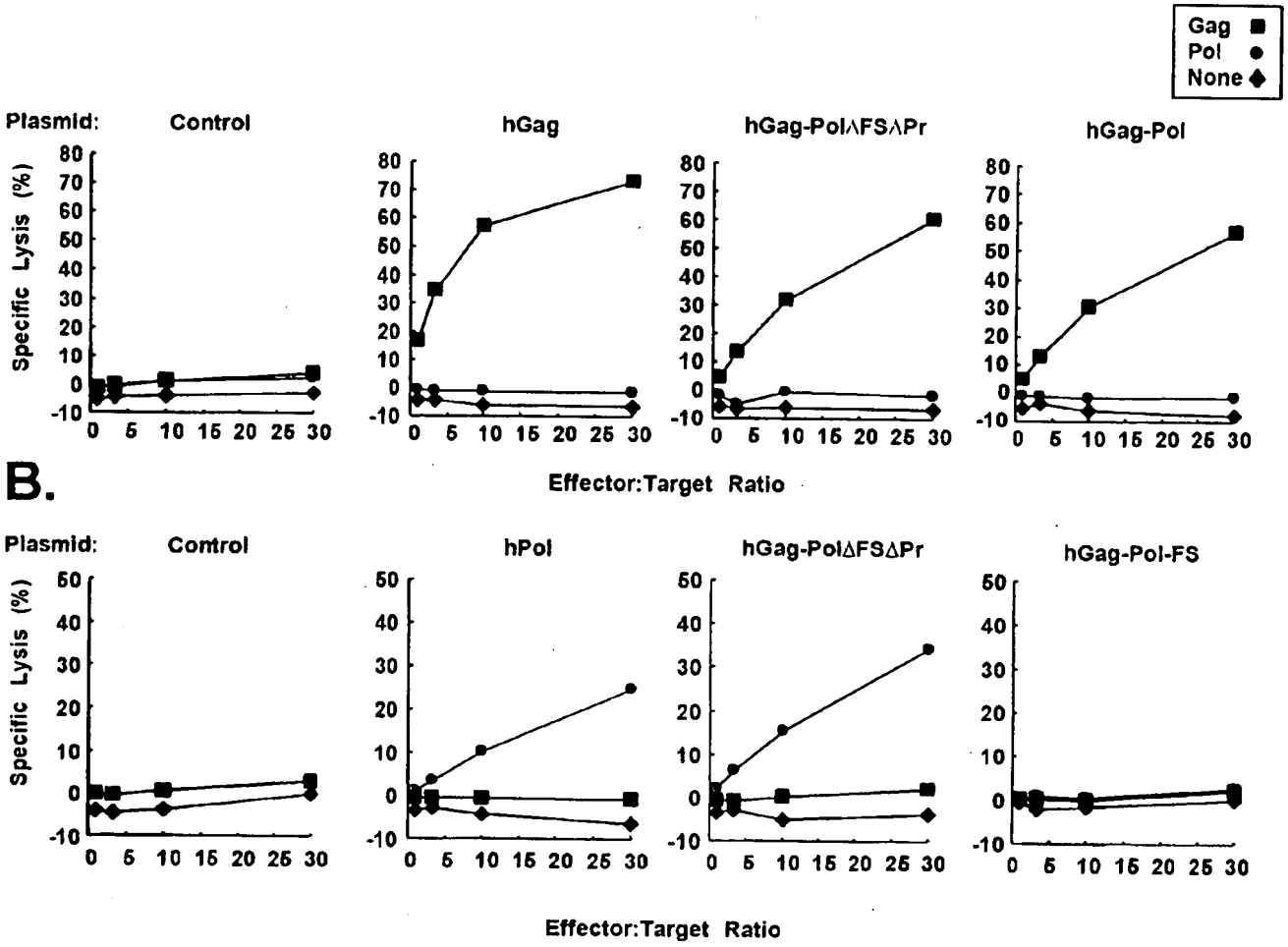

A.
B.
Plasmid:
Control
hGag
hGag-Pol ΔFSΔPR
hGag-Pol
hPol
Peptides
Gag
Pol
None
Specific Lysis (%)
Effector:Target Ratio

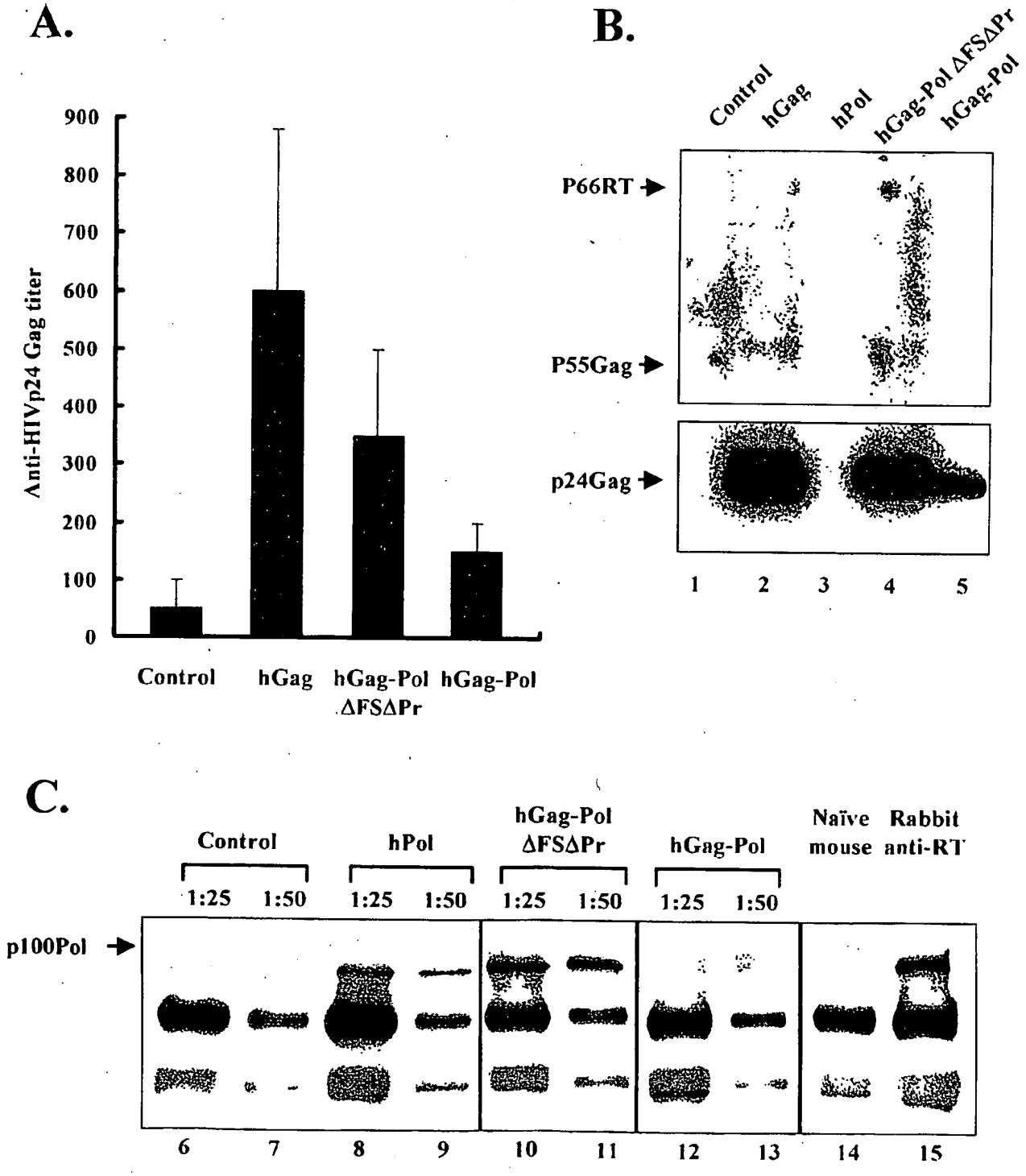
Figure X


pGag
αCD4
αCD8
Control
pPol
αCD4
αCD8
Control
Specific Lysis (%)
Effector:Target Ratio

C.

Figure XI


A.
Gag
Pol
None
Plasmid:
Control
hGag
hGag-PolΔFSΔPr
hGag-Pol
Specific Lysis (%)
Effector:Target Ratio
B.
Plasmid:
Control
hPol
hGag-PolΔFSΔPr
hGag-Pol-FS
Specific Lysis (%)
Effector:Target Ratio


A.
Anti-HIVp24 Gag titer
900
800
700
600
500
400
300
200
100
0
Control
hGag
hGag-Pol ΔFSΔPr
hGag-Pol
B.
Control
hGag
hPol
hGag-Pol ΔFSΔPr
hGag-Pol
P66RT
P55Gag
p24Gag
1 2 3 4 5
C.
Control
hPol
hGag-Pol ΔFSΔPr
hGag-Pol
Naïve mouse
Rabbit anti-RT
1:25 1:50 1:25 1:50 1:25 1:50 1:25 1:50
p100Pol
6 7 8 9 10 11 12 13 14 15

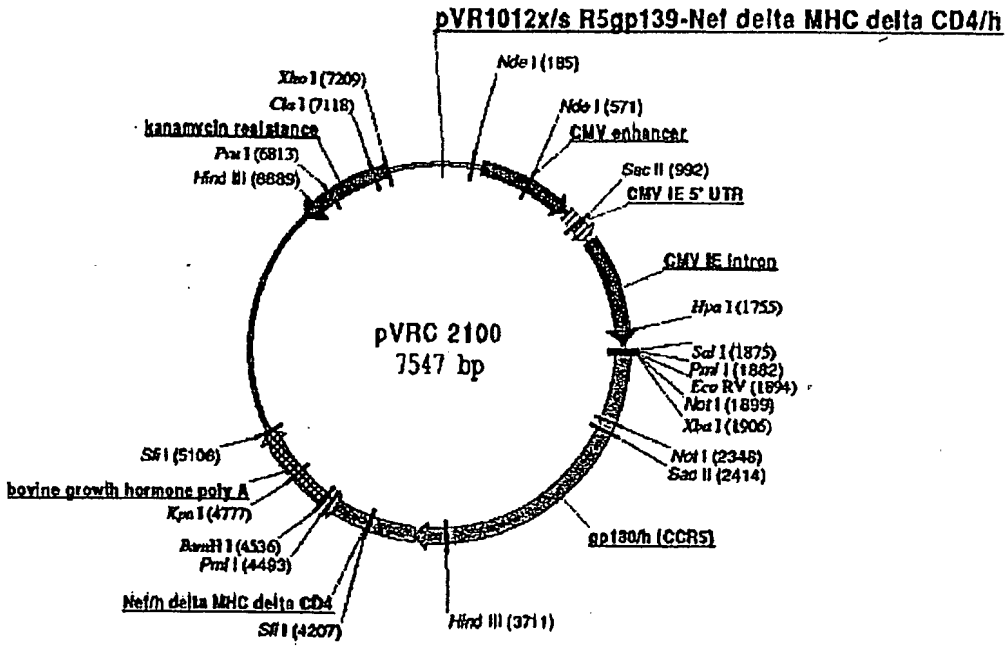

pVR1012x/s R5gp139-Nef delta MHC delta CD4/h
pVRC 2100
7547 bp
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pst I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Not I (2348)
Sac II (2414)
gp130/h (CCR5)
Hind III (3711)
Sfi I (4207)
Nef/h delta MHC delta CD4
Pml I (4493)
BamH I (4536)
Kpn I (4777)
bovine growth hormone poly A
Sfi I (5106)
kanamycin resistance
Pvu I (6813)
Hind III (6889)
Cla I (7118)
Xho I (7209)

Figure 1

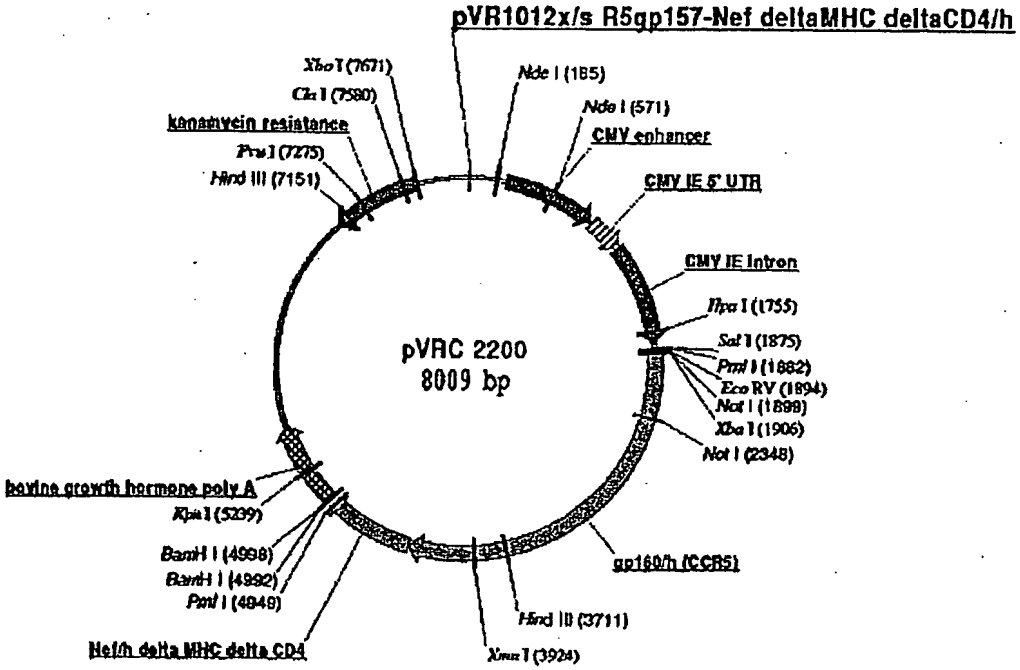

pVR1012x/s R5gp157-Nef deltaMHC deltaCD4/h
pVRC 2200
8009 bp
Xba I (7671)
Cla I (7580)
kanamycin resistance
Pvu I (7275)
Hind III (7151)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1898)
Xba I (1906)
Not I (2348)
gp160/h (CCR5)
Hind III (3711)
Xmn I (3924)
Nef/h delta MHC delta CD4
BamH I (4992)
Pml I (4949)
bovine growth hormone poly A
Xba I (5299)

Figure 2

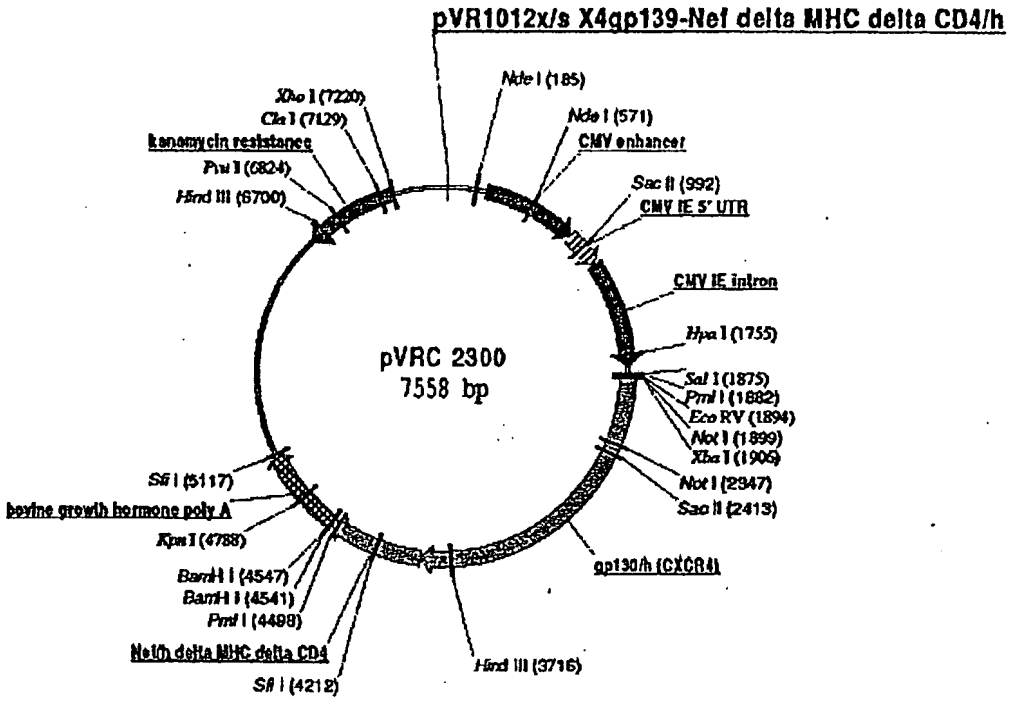

pVR1012x/s X4gp139-Nef delta MHC delta CD4/h
pVRC 2300
7558 bp
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Not I (2347)
Sac II (2413)
gp130/h (CXCR4)
Hind III (3716)
Sfi I (4212)
Nef/h delta MHC delta CD4
Pml I (4498)
BamH I (4541)
BamH I (4547)
Xpn I (4788)
bovine growth hormone poly A
Sfi I (5117)
Hind III (6700)
Pvu I (6824)
kanomycin resistance
Cla I (7129)
Xho I (7220)

Figure 3

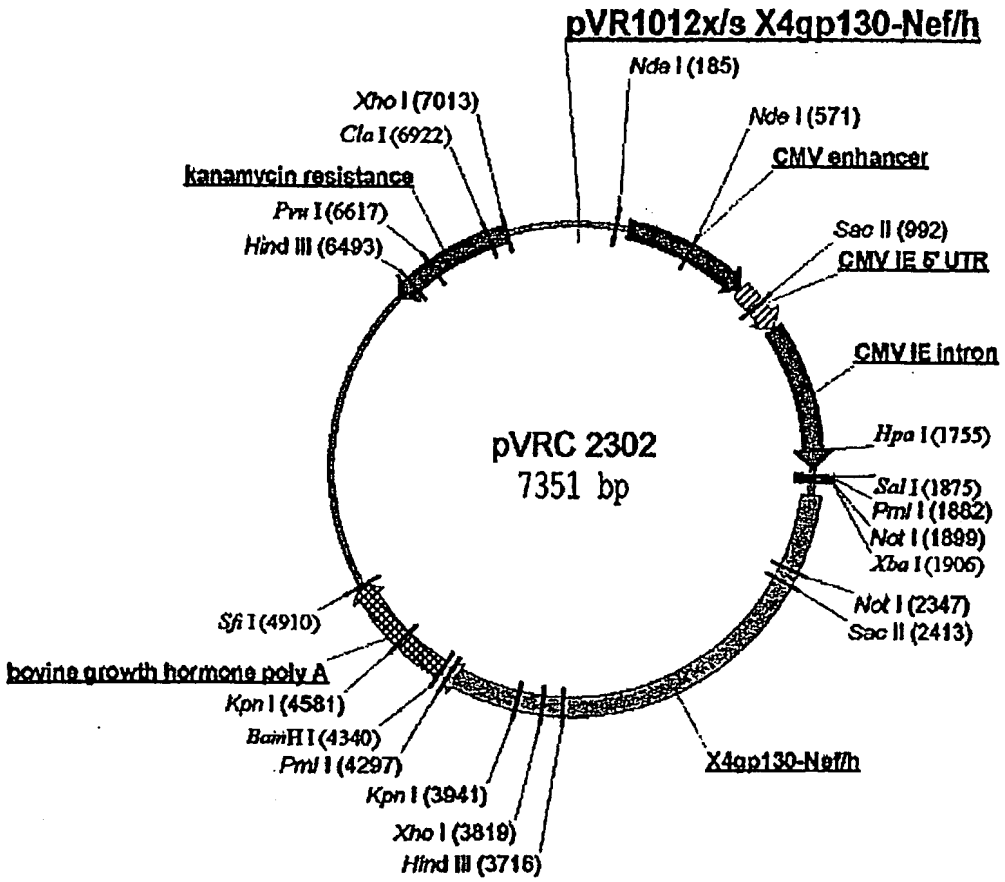

pVR1012x/s X4gp130-Nef/h
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Not I (1899)
Xba I (1906)
Not I (2347)
Sac II (2413)
X4gp130-Nef/h
Xho I (3819)
Hind III (3716)
Kpn I (3941)
Pml I (4297)
BamH I (4340)
Kpn I (4581)
bovine growth hormone poly A
Sfi I (4910)
kanamycin resistance
Pvu I (6617)
Hind III (6493)
Cla I (6922)
Xho I (7013)
pVRC 2302
7351 bp

Figure 4

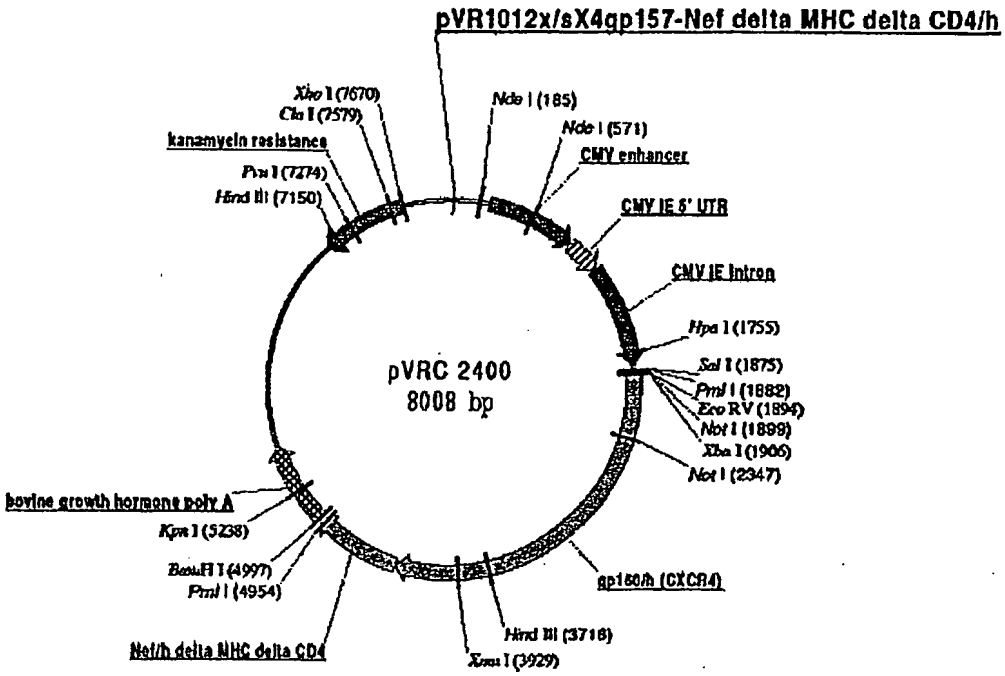

pVR1012x/sX4gp157-Nef delta MHC delta CD4/h
pVRC 2400
8008 bp
Xho I (7670)
Cla I (7579)
kanamycin resistance
Pvu I (7274)
Hind III (7150)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Not I (2347)
gp160/h (CXCR4)
Hind III (3718)
Xmn I (3929)
Nef/h delta MHC delta CD4
bovine growth hormone poly A
Kpn I (5238)
BamH I (4997)
Pml I (4954)

Figure 5

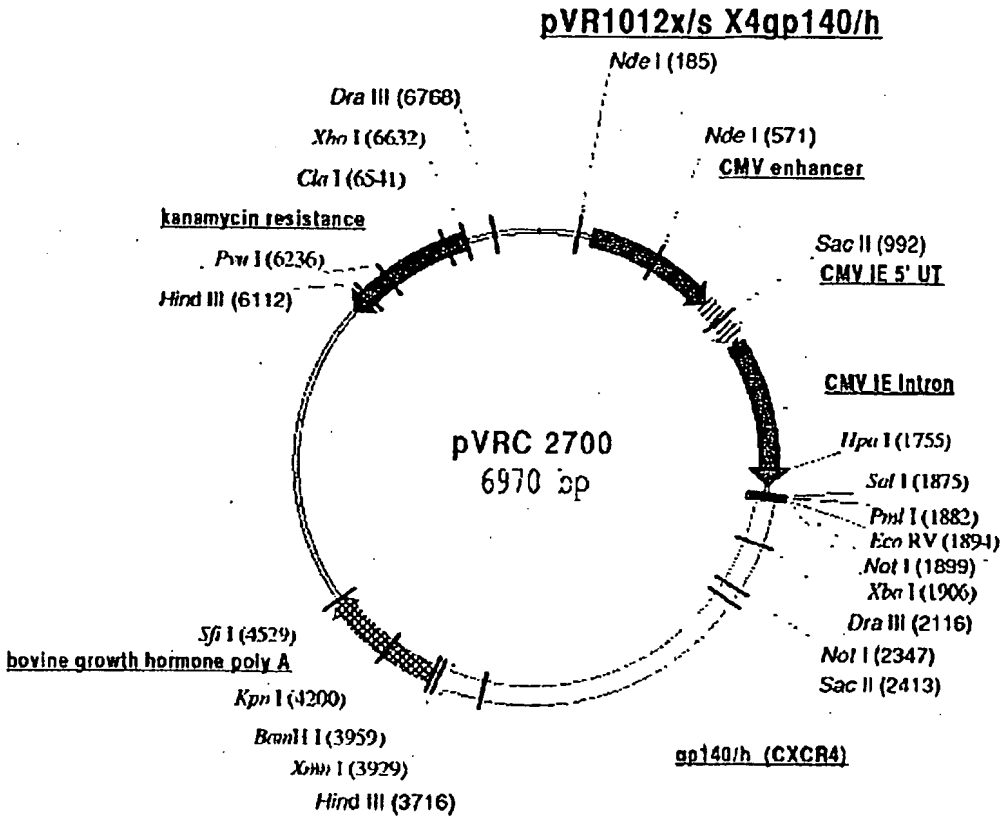

pVR1012x/s X4gp140/h
Nde I (185)
Dra III (6768)
Xho I (6632)
Cla I (6541)
Nde I (571)
CMV enhancer
kanamycin resistance
Pvu I (6236)
Hind III (6112)
Sac II (992)
CMV IE 5' UT
CMV IE Intron
pVRC 2700
6970 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
Sfi I (4529)
bovine growth hormone poly A
Kpn I (4200)
BamH I (3959)
Xba I (3929)
Hind III (3716)
gp140/h (CXCR4)

Figure 6

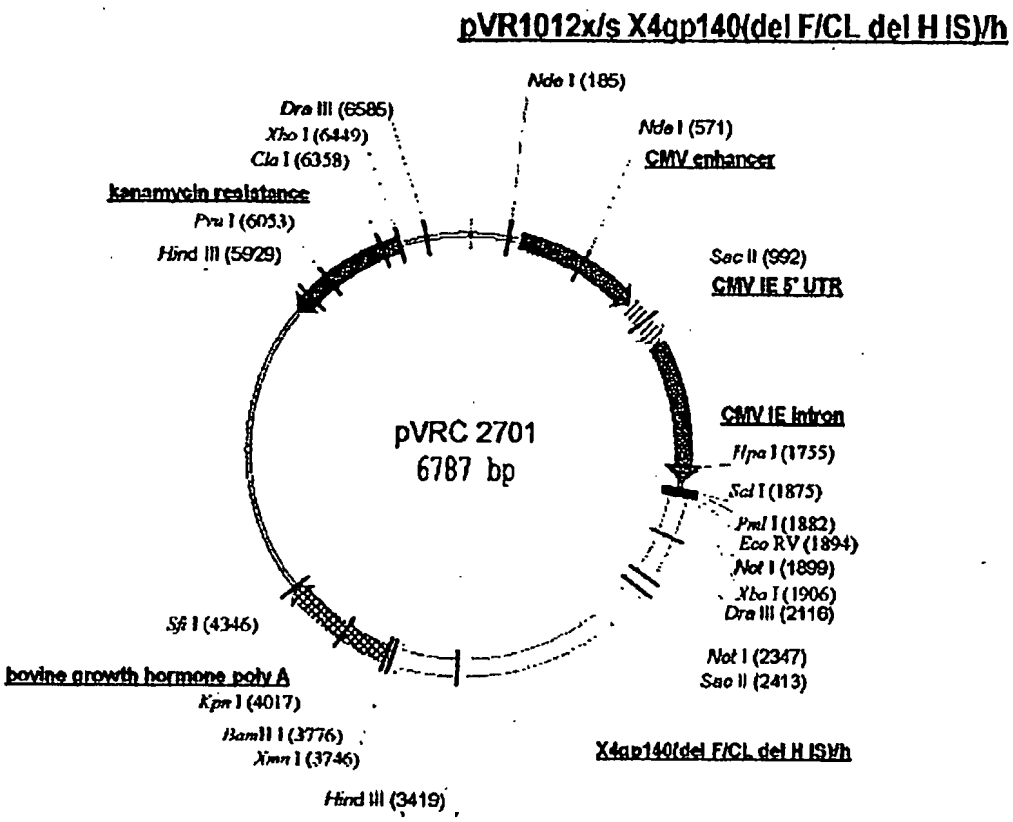

pVR1012x/s X4gp140(del F/CL del H IS)/h
Nde I (185)
Dra III (6585)
Xho I (6449)
Cla I (6358)
Nde I (571)
CMV enhancer
kanamycin resistance
Pvu I (6053)
Hind III (5929)
Sac II (992)
CMV IE 5' UTR
pVRC 2701
6787 bp
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Sfi I (4346)
Not I (2347)
Sac II (2413)
bovine growth hormone poly A
Kpn I (4017)
BamH I (3776)
Xmn I (3746)
X4gp140(del F/CL del H IS)/h
Hind III (3419)

Figure 7

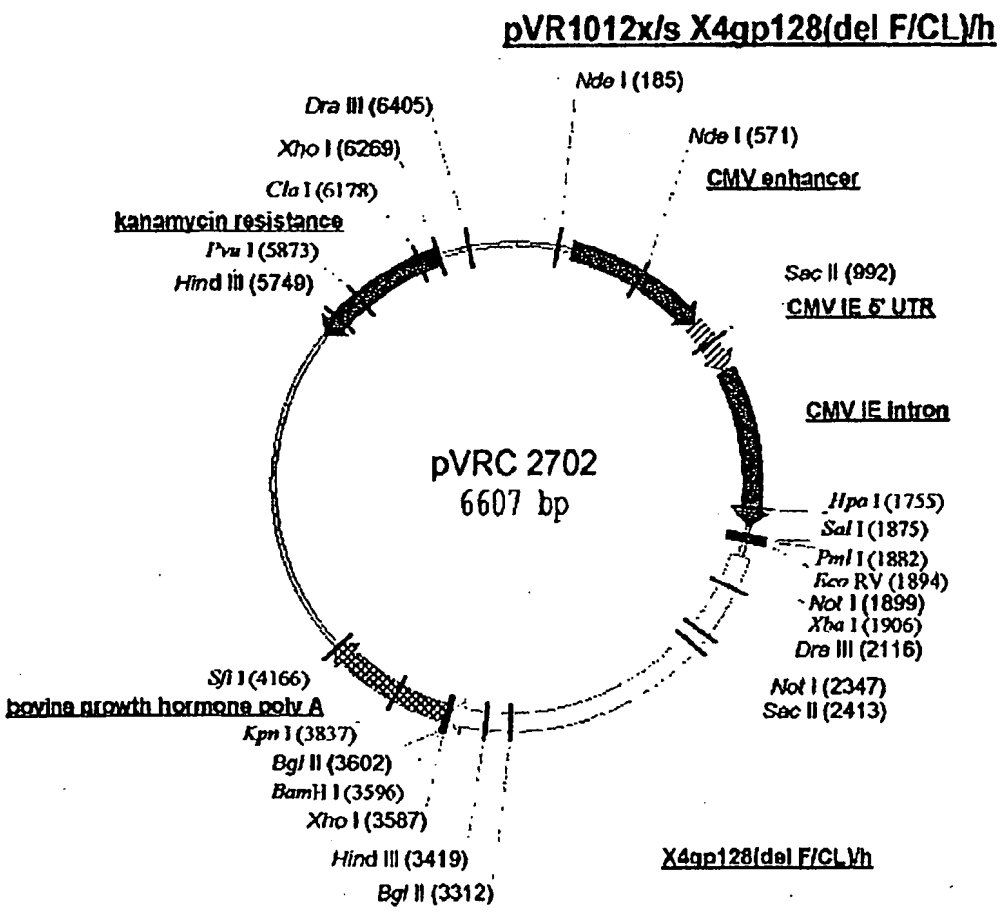

pVR1012x/s X4gp128(del F/CL)/h
Nde I (185)
Dra III (6405)
Xho I (6269)
Nde I (571)
CMV enhancer
Cla I (6178)
kanamycin resistance
Pvu I (5873)
Hind III (5749)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
pVRC 2702
6607 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
Sfi I (4166)
bovine growth hormone poly A
Kpn I (3837)
Bgl II (3602)
BamH I (3596)
Xho I (3587)
Hind III (3419)
Bgl II (3312)
X4gp128(del F/CL)/h

Figure 8

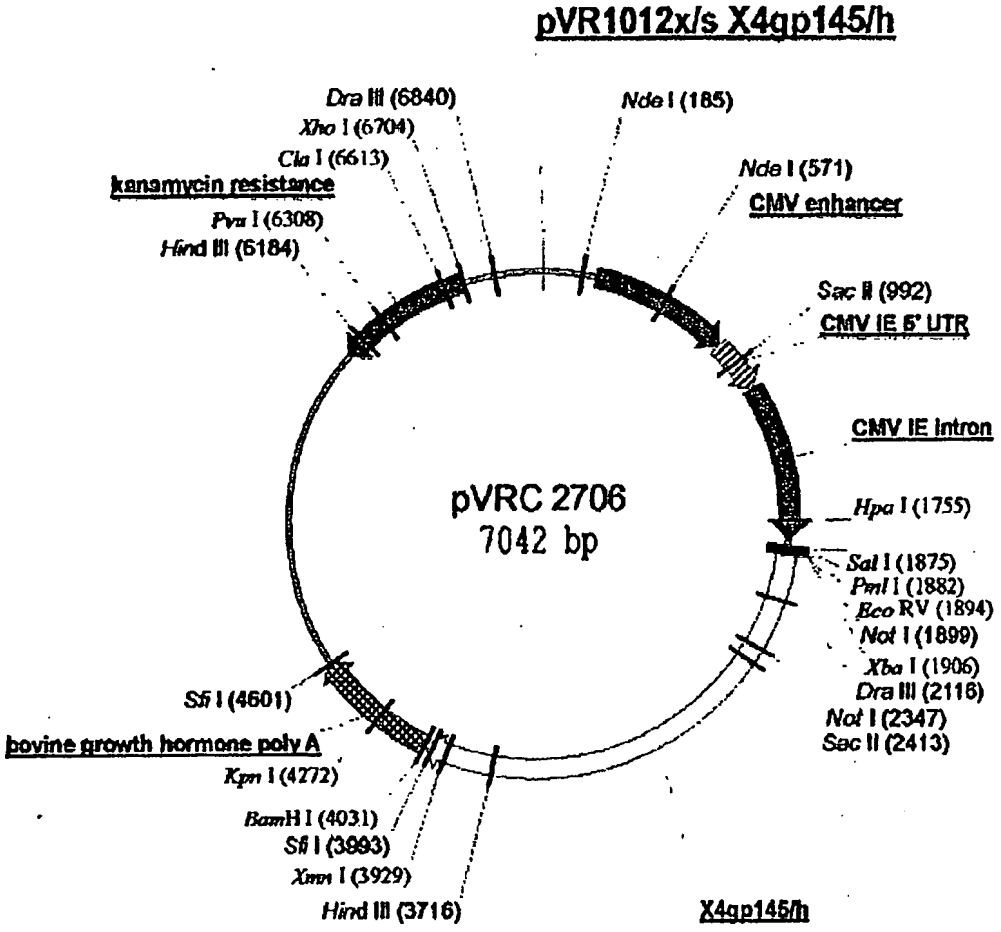

pVR1012x/s X4gp145/h
Dra III (6840)
Xho I (6704)
Cla I (6613)
kanamycin resistance
Pvu I (6308)
Hind III (6184)
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
pVRC 2706
7042 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
Sfi I (4601)
bovine growth hormone poly A
Kpn I (4272)
BamH I (4031)
Sfi I (3993)
Xmn I (3929)
Hind III (3716)
X4gp145/h

Figure 9

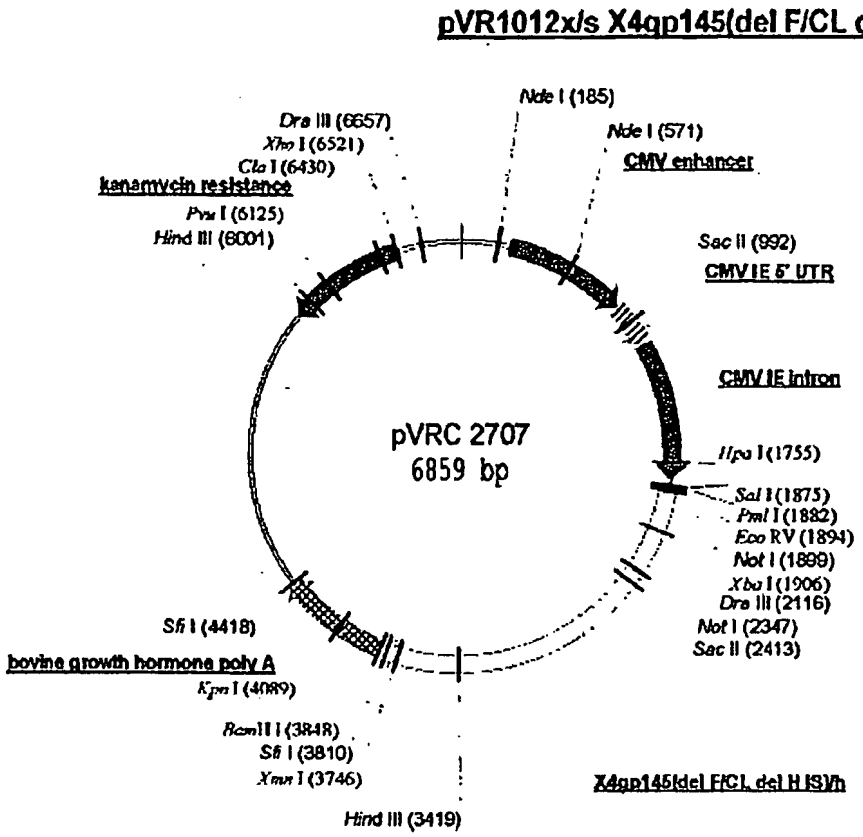

pVR1012x/s X4gp145(del F/CL del H IS)/h
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
X4gp145(del F/CL del H IS)/h
Hind III (3419)
Xmn I (3746)
Sfi I (3810)
BamH I (3848)
Kpn I (4089)
bovine growth hormone poly A
Sfi I (4418)
kanamycin resistance
Pvu I (6125)
Hind III (6001)
Cla I (6430)
Xho I (6521)
Dra III (6657)
pVRC 2707
6859 bp

Figure 10

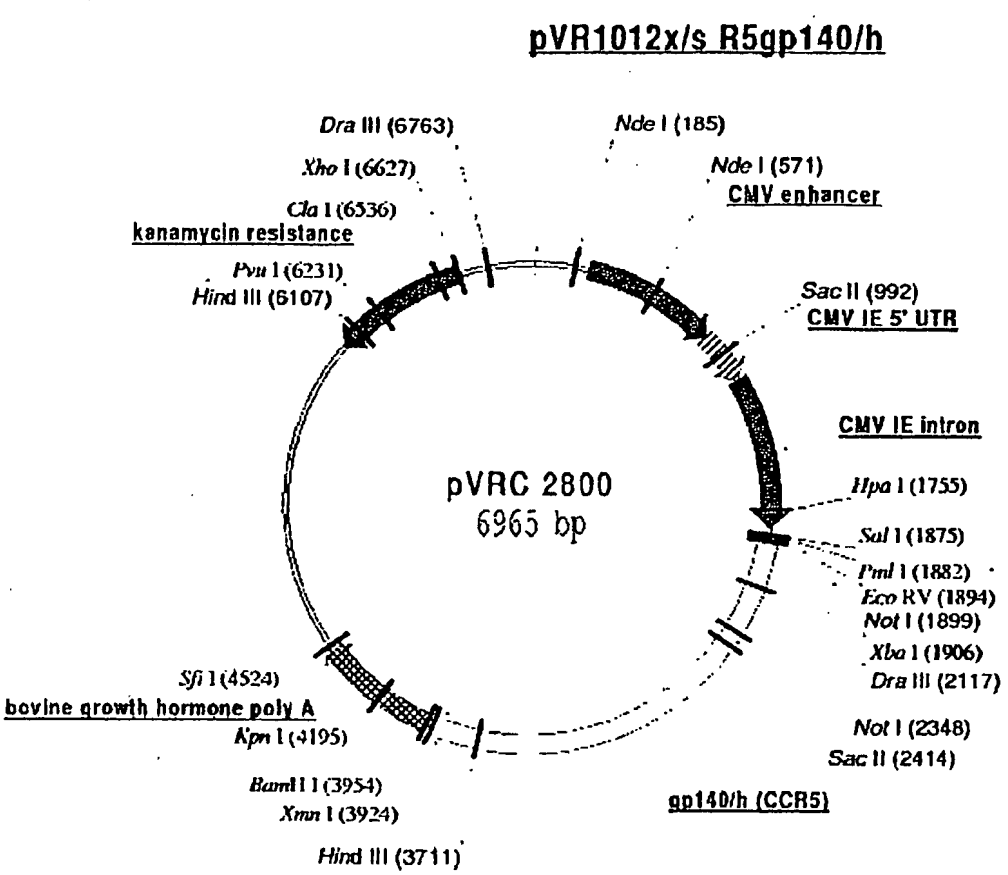

pVR1012x/s R5gp140/h
Dra III (6763)
Nde I (185)
Xho I (6627)
Nde I (571)
CMV enhancer
Cla I (6536)
kanamycin resistance
Pvu I (6231)
Hind III (6107)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
pVRC 2800
6965 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2117)
Sfi I (4524)
bovine growth hormone poly A
Kpn I (4195)
Not I (2348)
Sac II (2414)
BamH I (3954)
Xmn I (3924)
gp140/h (CCR5)
Hind III (3711)

Figure 11

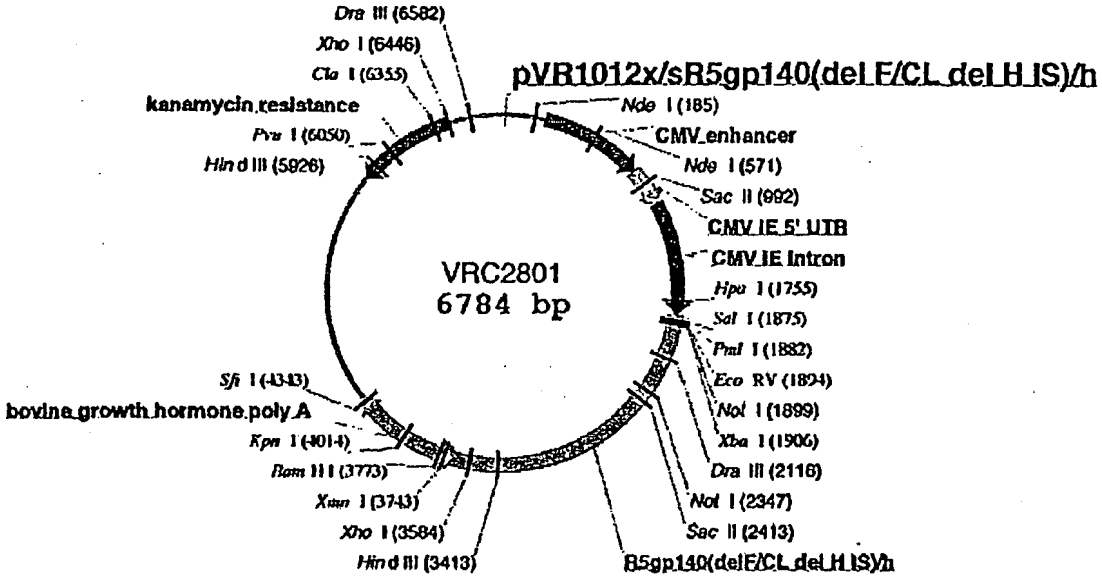

pVR1012x/sR5gp140(delF/CL_delH IS)/h
VRC2801
6784 bp
Dra III (6582)
Xho I (6446)
Cla I (6355)
kanamycin resistance
Pvu I (6050)
Hind III (5926)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
R5gp140(delF/CL_delH IS)/h
Hind III (3413)
Xho I (3584)
Xmn I (3743)
Bam HI (3773)
Kpn I (4014)
bovine growth hormone poly A
Sfi I (4343)

Figure 12

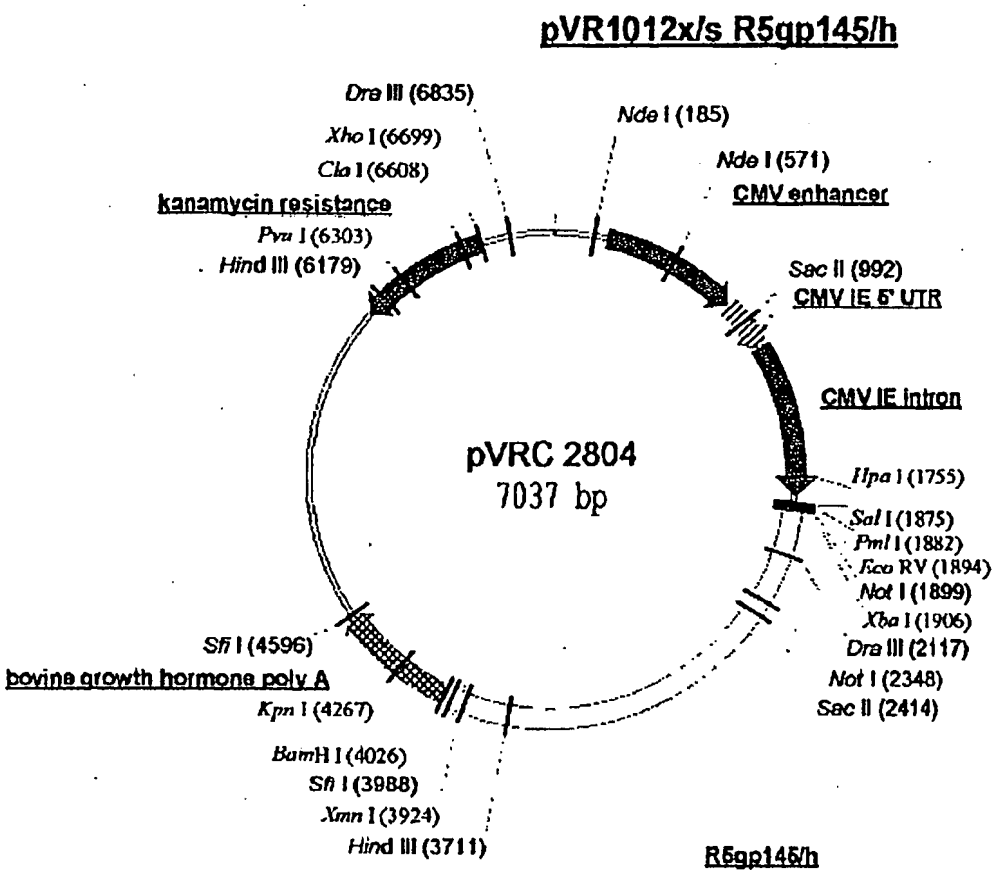

pVR1012x/s R5gp145/h
Dra III (6835)
Xho I (6699)
Cla I (6608)
kanamycin resistance
Pvu I (6303)
Hind III (6179)
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE intron
pVRC 2804
7037 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2117)
Not I (2348)
Sac II (2414)
Sfi I (4596)
bovine growth hormone poly A
Kpn I (4267)
BamH I (4026)
Sfi I (3988)
Xmn I (3924)
Hind III (3711)
R5gp145/h

Figure 13

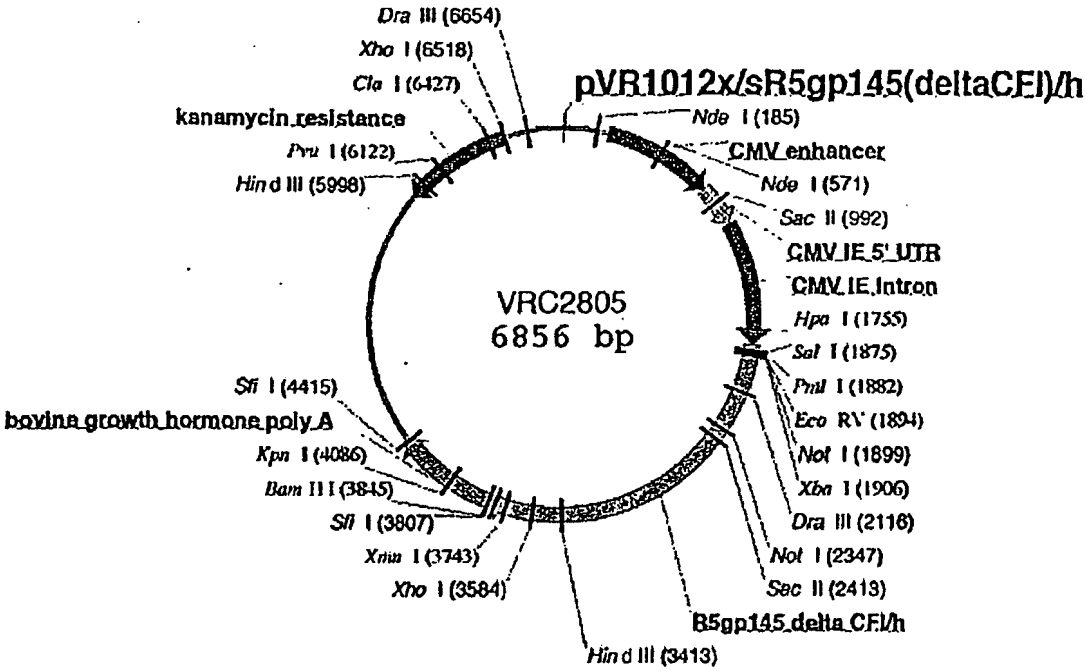

pVR1012x/sR5gp145(deltaCFI)/h
VRC2805
6856 bp
Dra III (6654)
Xho I (6518)
Cla I (6427)
kanamycin resistance
Pvu I (6122)
Hind III (5998)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
R5gp145 delta CFI/h
Hind III (3413)
Xho I (3584)
Xmn I (3743)
Sfi I (3807)
Bam HI (3845)
Kpn I (4086)
bovine growth hormone poly A
Sfi I (4415)

Figure 14

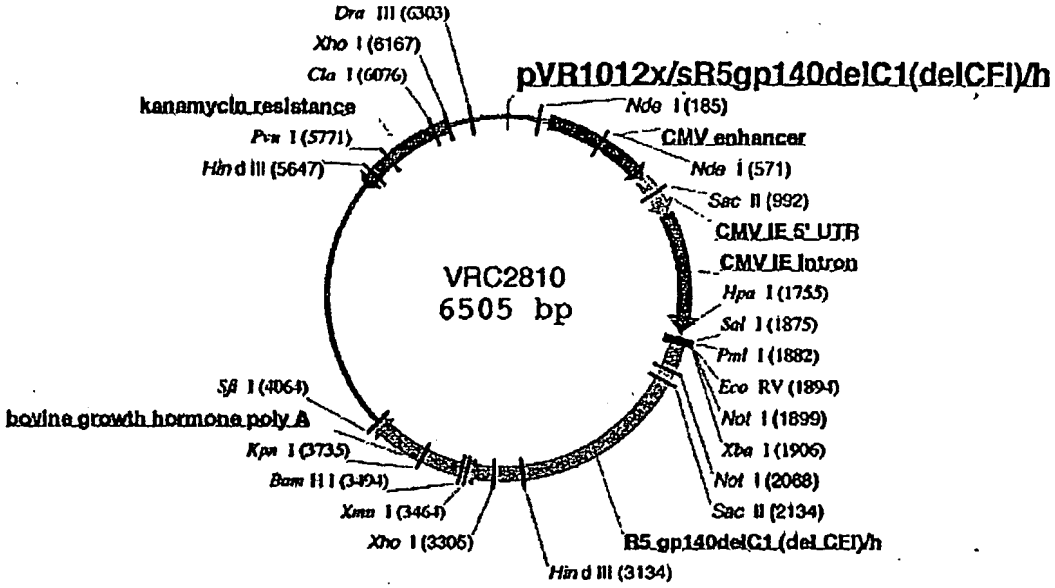

pVR1012x/sR5gp140delC1(delCFI)/h
VRC2810
6505 bp
Dra III (6303)
Xho I (6167)
Cla I (6076)
kanamycin resistance
Pvu I (5771)
Hind III (5647)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Not I (2068)
Sac II (2134)
R5 gp140delC1 (delCFI)/h
Hind III (3134)
Xho I (3305)
Xmn I (3461)
Bam HI (3494)
Kpn I (3735)
Sfi I (4064)
bovine growth hormone poly A

Figure 15

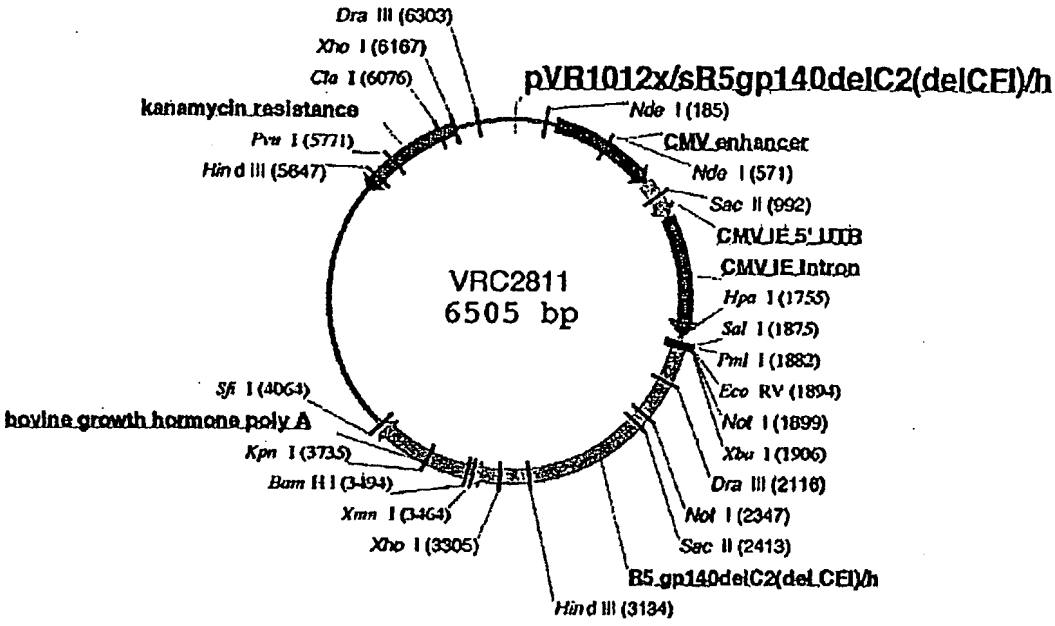

pVR1012x/sR5gp140delC2(delCFI)/h
VRC2811
6505 bp
Dra III (6303)
Xho I (6167)
Cla I (6076)
kanamycin resistance
Pvu I (5771)
Hind III (5647)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
R5 gp140delC2(delCFI)/h
Hind III (3134)
Xho I (3305)
Xmn I (3464)
BamH I (3494)
Kpn I (3735)
Sfi I (4064)
bovine growth hormone poly A

Figure 16

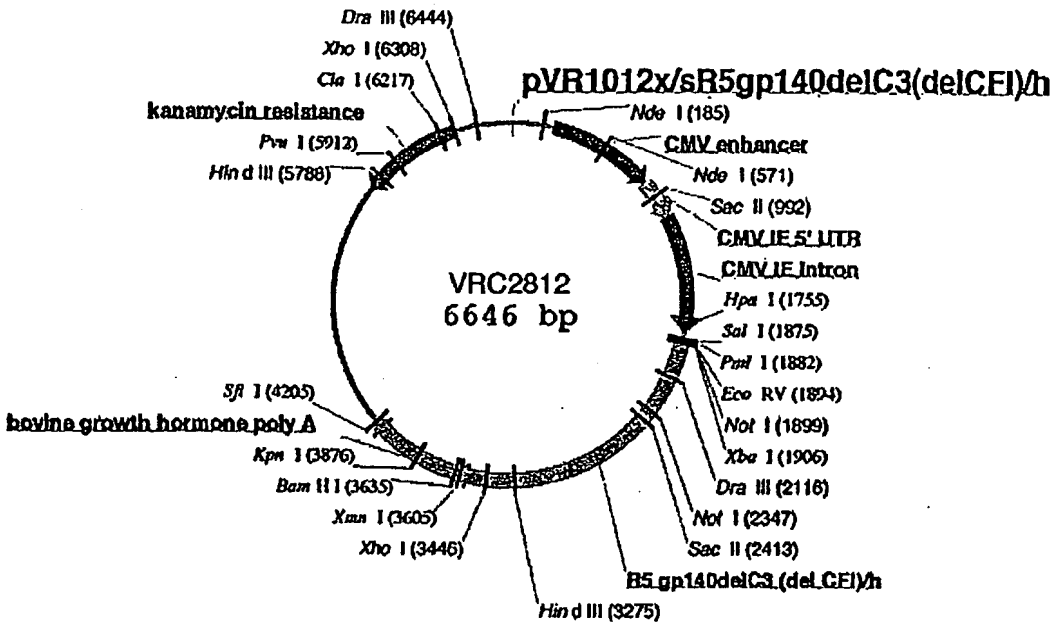

pVR1012x/sR5gp140delC3(delCFI)/h
VRC2812
6646 bp
Dra III (6444)
Xho I (6308)
Cla I (6217)
kanamycin resistance
Pvu I (5912)
Hind III (5788)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
R5 gp140delC3 (del CFI)/h
Hind III (3275)
Xho I (3446)
Xmn I (3605)
Bam HI (3635)
Kpn I (3876)
bovine growth hormone poly A
Sfi I (4205)

Figure 17

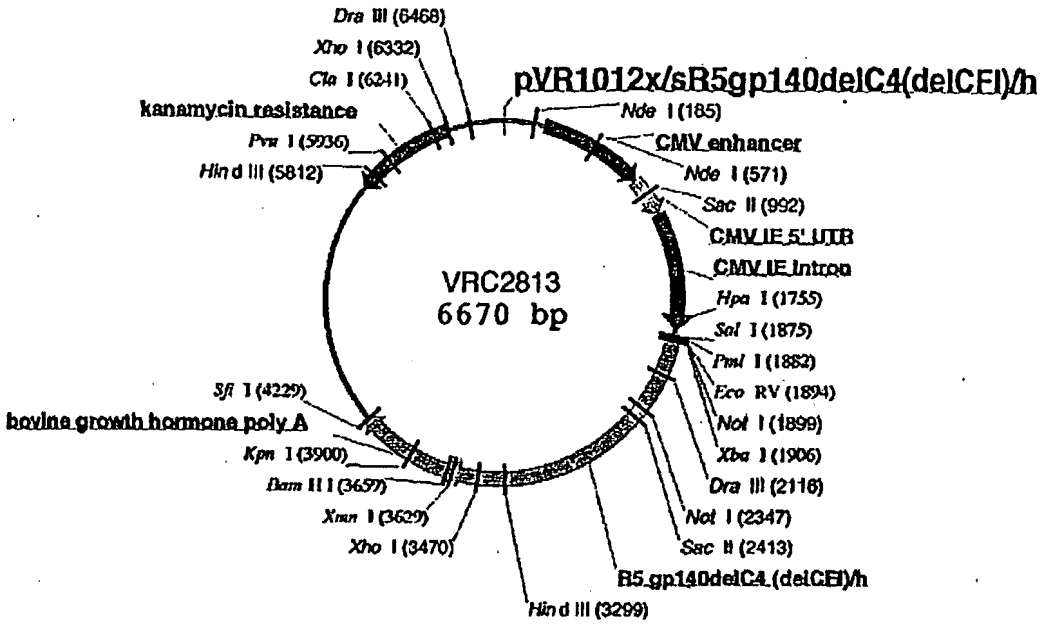

pVR1012x/sB5gp140delC4(delCFI)/h
VRC2813
6670 bp
Dra III (6468)
Xho I (6332)
Cla I (6241)
kanamycin resistance
Pvu I (5936)
Hind III (5812)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
B5 gp140delC4 (delCFI)/h
Hind III (3299)
Xho I (3470)
Xmn I (3629)
BamH I (3697)
Kpn I (3900)
bovine growth hormone poly A
Sfi I (4229)

Figure 18

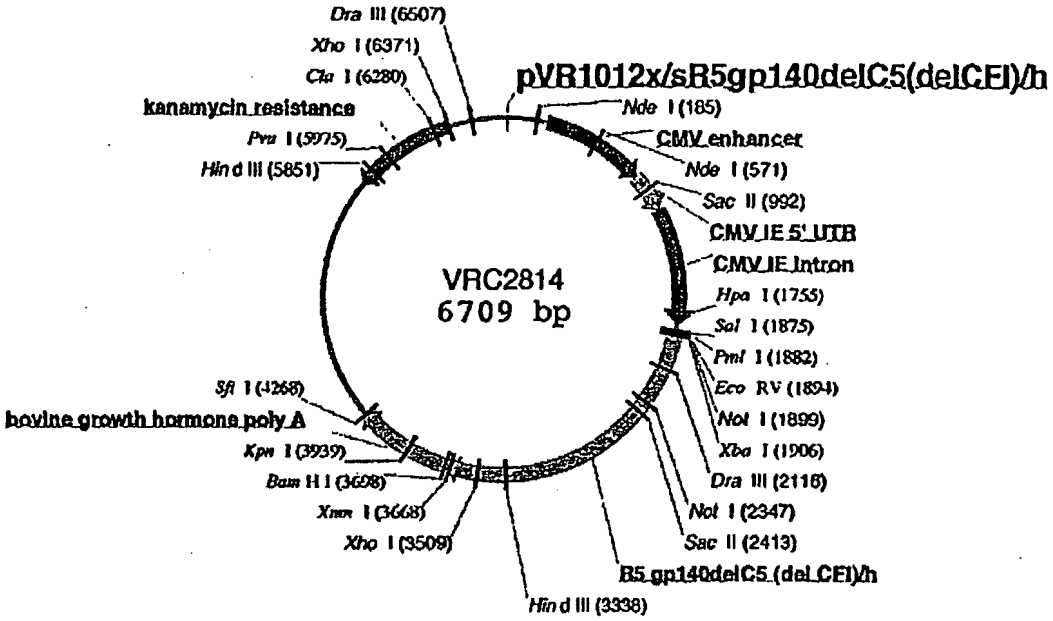

pVR1012x/sR5gp140delC5(delCFI)/h
VRC2814
6709 bp
Dra III (6507)
Xho I (6371)
Cla I (6280)
kanamycin resistance
Pvu I (5975)
Hind III (5851)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
B5 gp140delC5 (del CFI)/h
Hind III (3338)
Xho I (3509)
Xmn I (3668)
Bam H I (3698)
Kpn I (3939)
Sfi I (4268)
bovine growth hormone poly A

Figure 19

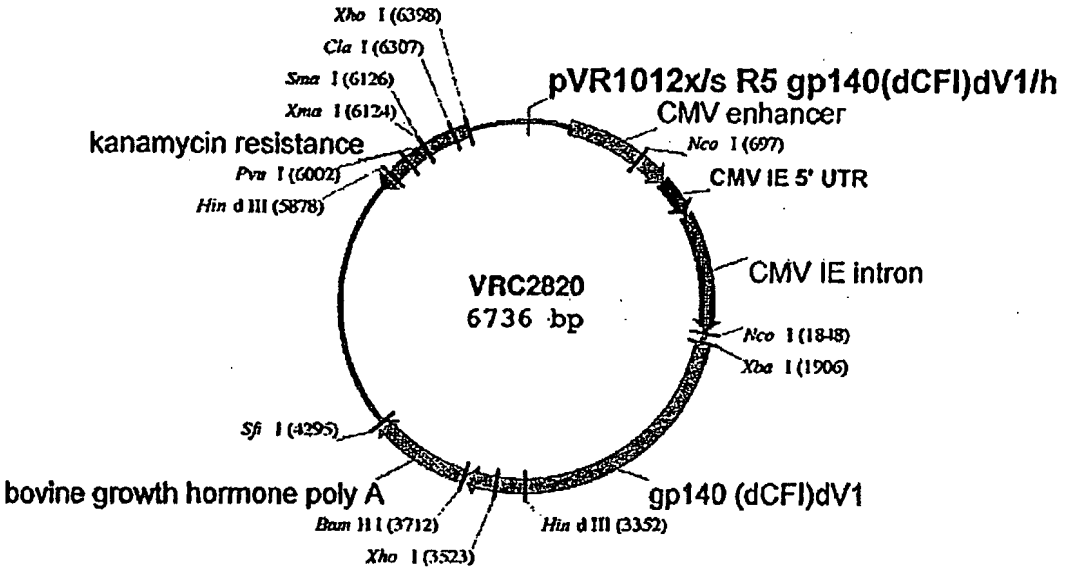

Xho I (6398)
Cla I (6307)
Sma I (6126)
Xma I (6124)
kanamycin resistance
Pvu I (6002)
Hin d III (5878)
pVR1012x/s R5 gp140(dCFI)dV1/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2820
6736 bp
Nco I (1848)
Xba I (1906)
Sfi I (4295)
bovine growth hormone poly A
gp140 (dCFI)dV1
Bam H I (3712)
Hin d III (3352)
Xho I (3523)

Figure 20

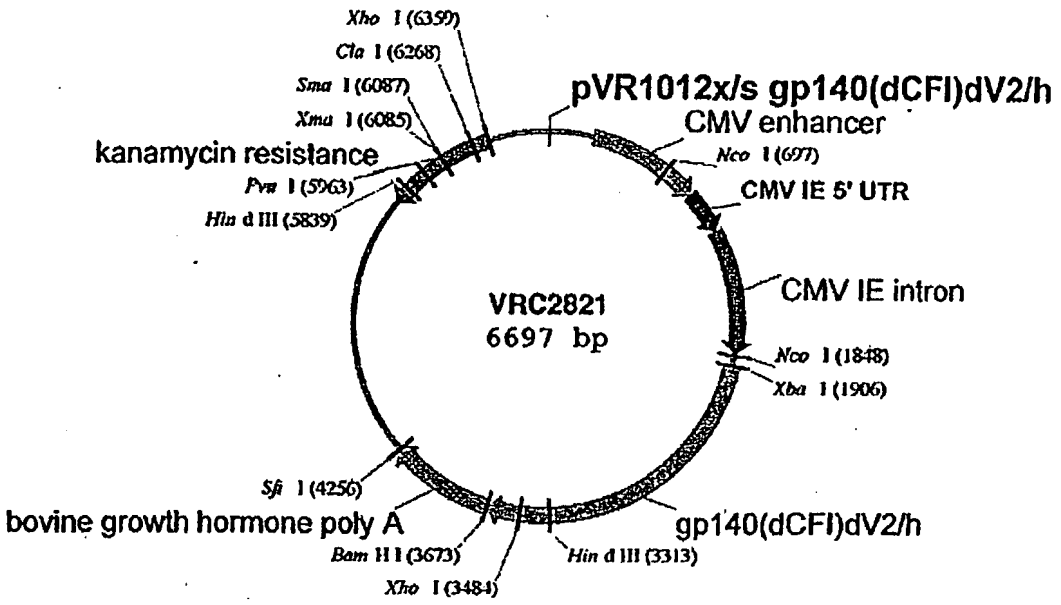

pVR1012x/s gp140(dCFI)dV2/h
CMV enhancer
CMV IE 5' UTR
CMV IE intron
gp140(dCFI)dV2/h
bovine growth hormone poly A
kanamycin resistance
VRC2821
6697 bp
Xho I (6359)
Cla I (6268)
Sma I (6087)
Xma I (6085)
Pvu I (5963)
Hin d III (5839)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4256)
Bam H I (3673)
Xho I (3484)
Hin d III (3313)

Figure 21

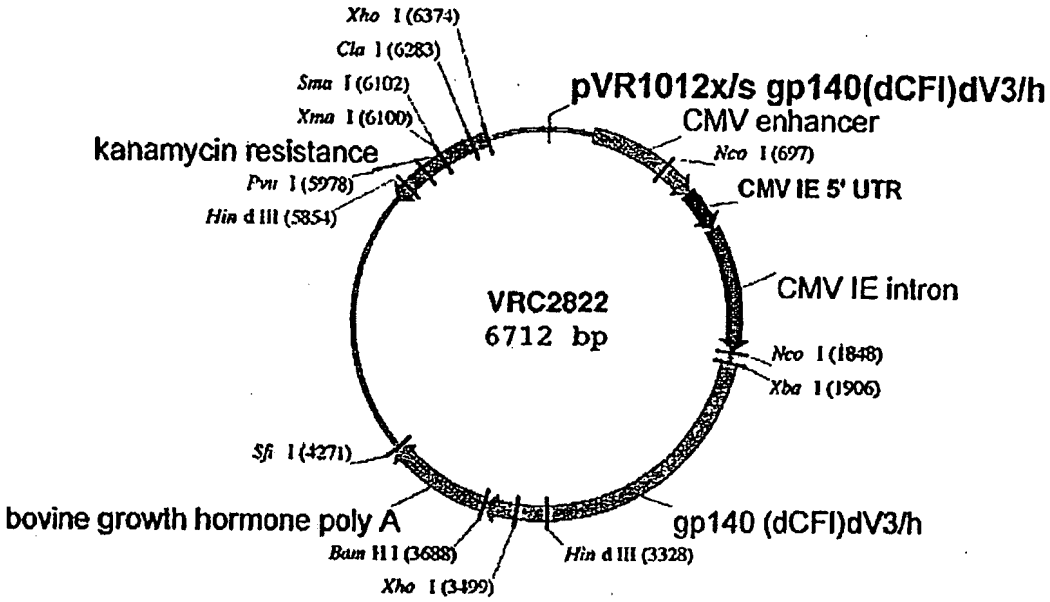

pVR1012x/s gp140(dCFI)dV3/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
Nco I (1848)
Xba I (1906)
gp140 (dCFI)dV3/h
Hin d III (3328)
Xho I (3499)
Bam H I (3688)
bovine growth hormone poly A
Sfi I (4271)
kanamycin resistance
Pvu I (5978)
Hin d III (5854)
Xho I (6374)
Cla I (6283)
Sma I (6102)
Xma I (6100)
VRC2822
6712 bp

Figure 22

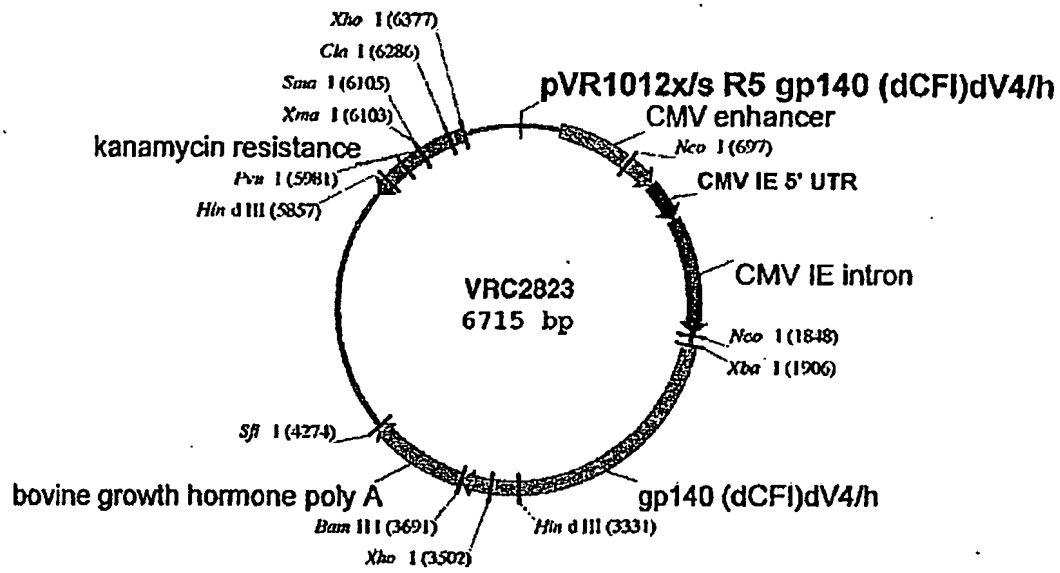

pVR1012x/s R5 gp140 (dCFI)dV4/h
VRC2823
6715 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
gp140 (dCFI)dV4/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6377)
Cla I (6286)
Sma I (6105)
Xma I (6103)
Pvu I (5981)
Hin d III (5857)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4274)
Bam III (3691)
Xho I (3502)
Hin d III (3331)

Figure 23

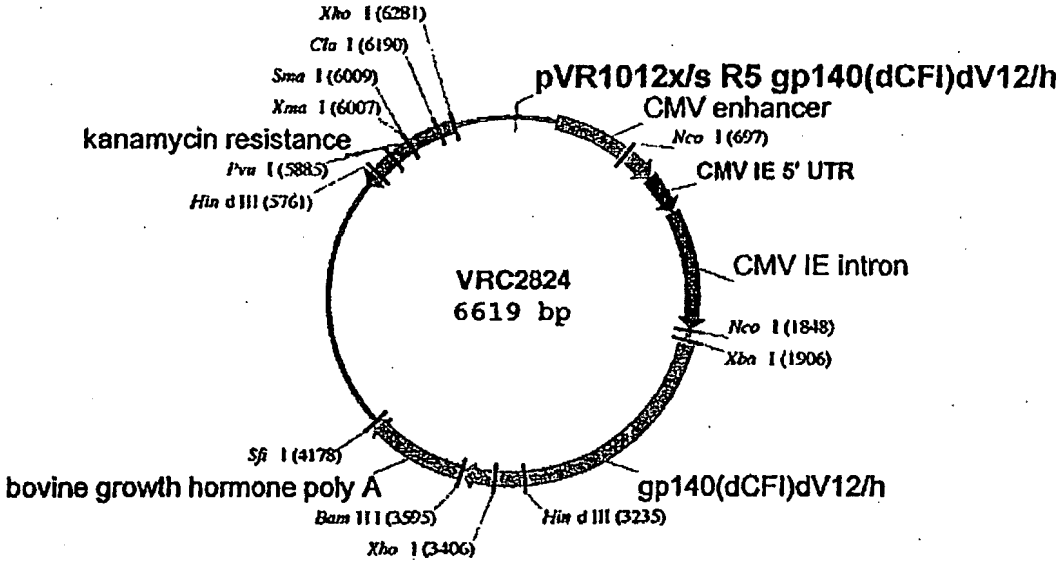

Xho I (6281)
Cla I (6190)
Sma I (6009)
Xma I (6007)
kanamycin resistance
Pvu I (5885)
Hin d III (5761)
pVR1012x/s R5 gp140(dCFI)dV12/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2824
6619 bp
Nco I (1848)
Xba I (1906)
Sfi I (4178)
bovine growth hormone poly A
gp140(dCFI)dV12/h
Bam III (3595)
Hin d III (3235)
Xho I (3406)

Figure 24

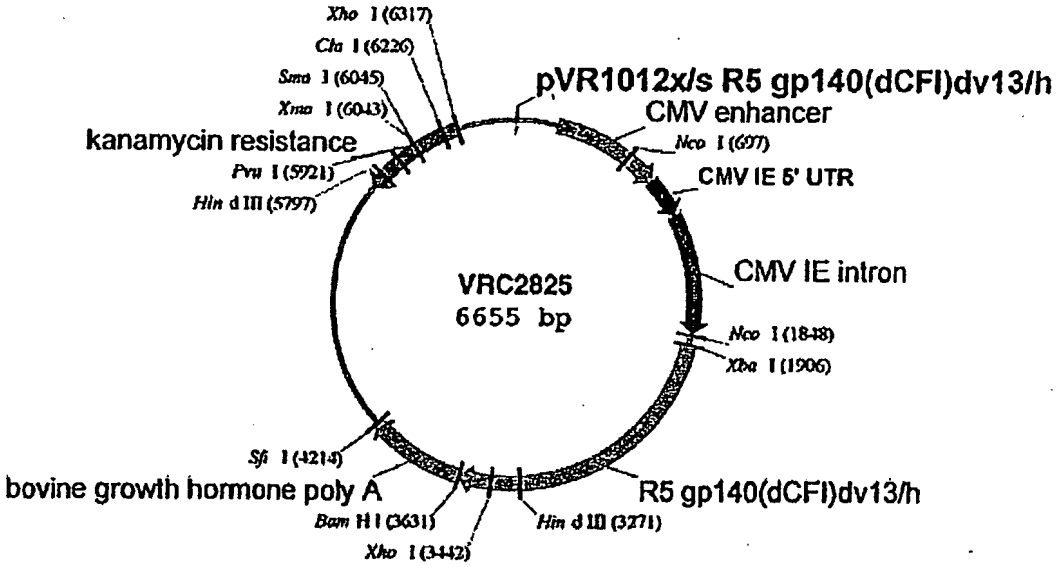

Xho I (6317)
Cla I (6226)
Sma I (6045)
Xma I (6043)
kanamycin resistance
Pvu I (5921)
Hin d III (5797)
pVR1012x/s R5 gp140(dCFI)dv13/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2825
6655 bp
Nco I (1848)
Xba I (1906)
Sfi I (4214)
bovine growth hormone poly A
R5 gp140(dCFI)dv13/h
Bam H I (3631)
Hin d III (3271)
Xho I (3442)

Figure 25

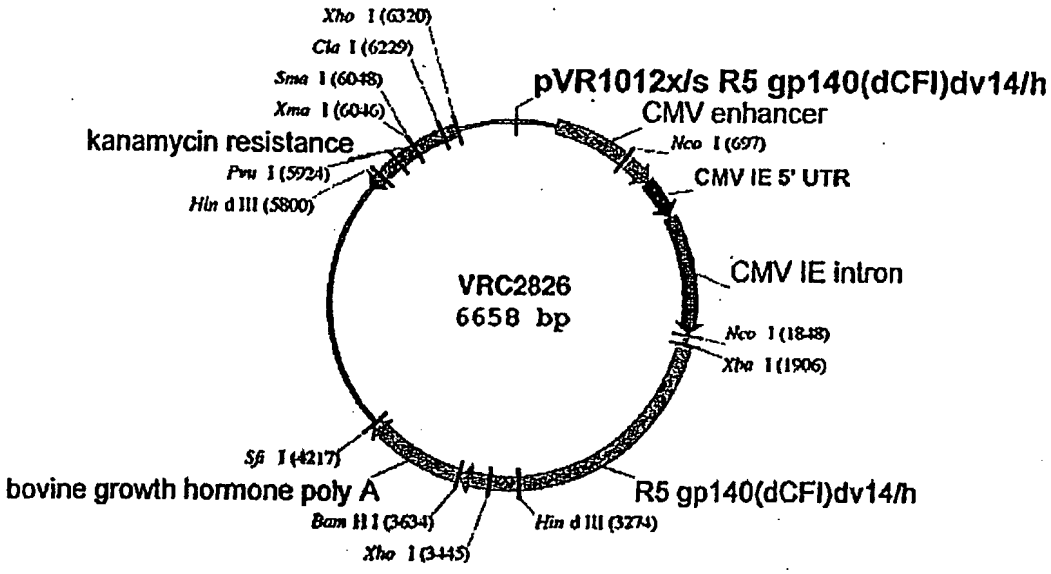

Xho I (6320)
Cla I (6229)
Sma I (6048)
Xma I (6046)
kanamycin resistance
Pvu I (5924)
Hin d III (5800)
pVR1012x/s R5 gp140(dCFI)dv14/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2826
6658 bp
Nco I (1848)
Xba I (1906)
Sfi I (4217)
bovine growth hormone poly A
R5 gp140(dCFI)dv14/h
Bam H I (3634)
Hin d III (3274)
Xho I (3445)

Figure 26

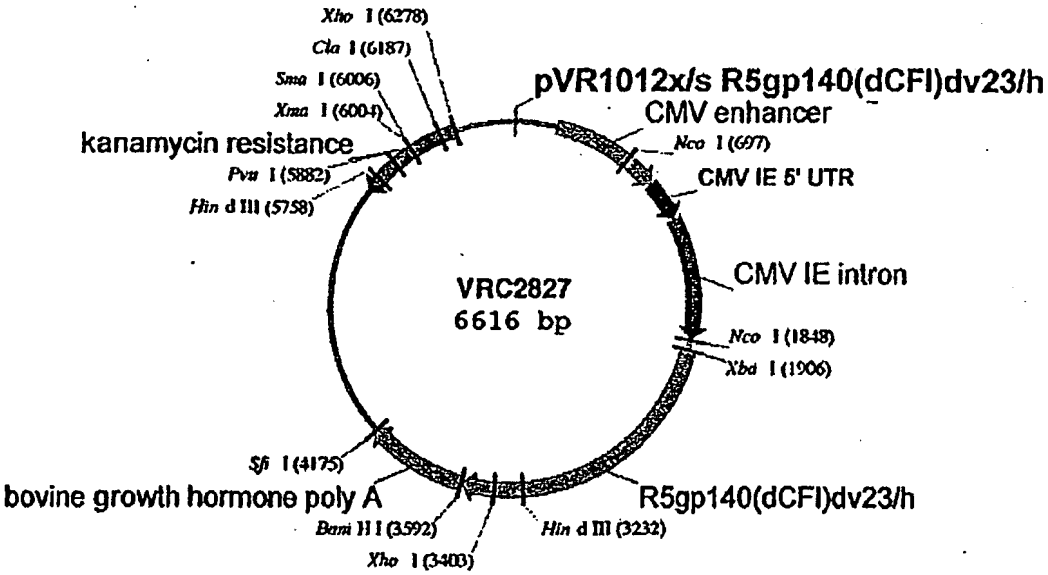

Xho I (6278)
Cla I (6187)
Sma I (6006)
Xma I (6004)
kanamycin resistance
Pvu I (5882)
Hin d III (5758)
pVR1012x/s R5gp140(dCFI)dv23/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2827
6616 bp
Nco I (1848)
Xba I (1906)
Sfi I (4175)
bovine growth hormone poly A
R5gp140(dCFI)dv23/h
Bam HI (3592)
Hin d III (3232)
Xho I (3403)

Figure 27

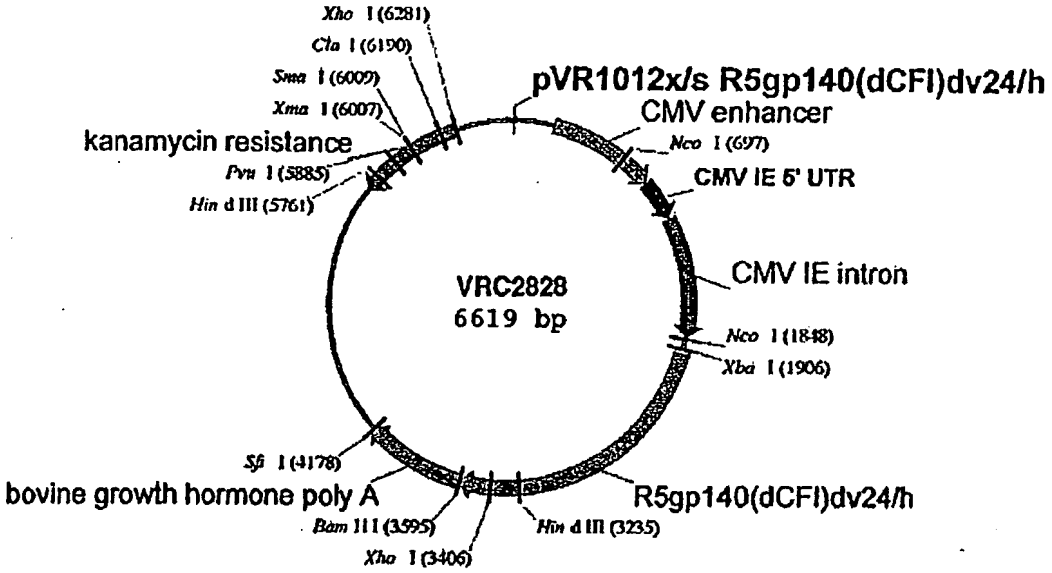

Xho I (6281)
Cla I (6190)
Sma I (6009)
Xma I (6007)
kanamycin resistance
Pvu I (5885)
Hin d III (5761)
pVR1012x/s R5gp140(dCFI)dv24/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2828
6619 bp
Nco I (1848)
Xba I (1906)
Sfi I (4178)
bovine growth hormone poly A
R5gp140(dCFI)dv24/h
Bam III (3595)
Hin d III (3235)
Xho I (3406)

Figure 28

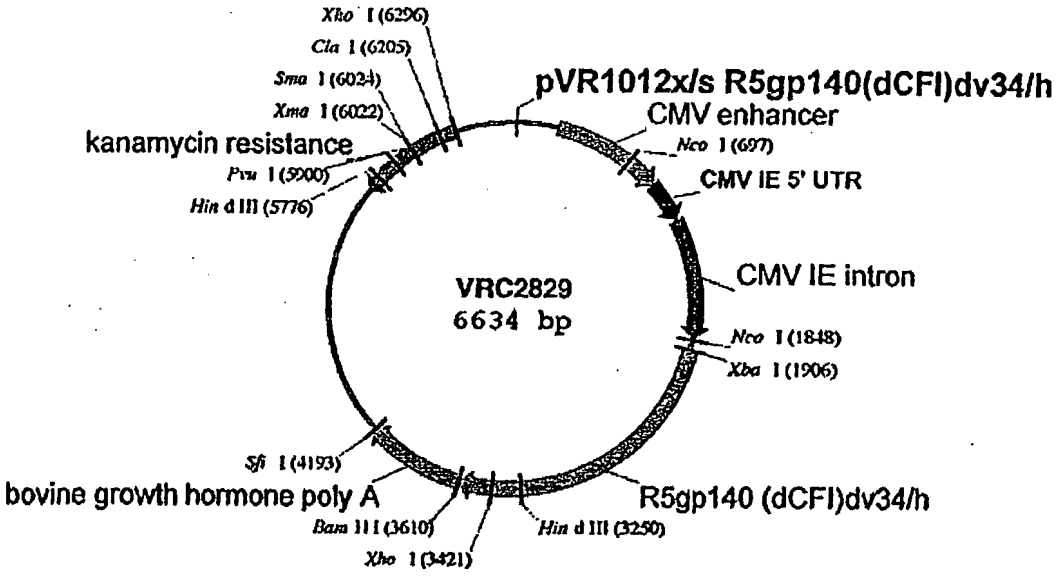

pVR1012x/s R5gp140(dCFI)dv34/h
VRC2829
6634 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp140 (dCFI)dv34/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6296)
Cla I (6205)
Sma I (6024)
Xma I (6022)
Pvu I (5900)
Hin d III (5776)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4193)
Bam III (3610)
Xho I (3421)
Hin d III (3250)

Figure 29

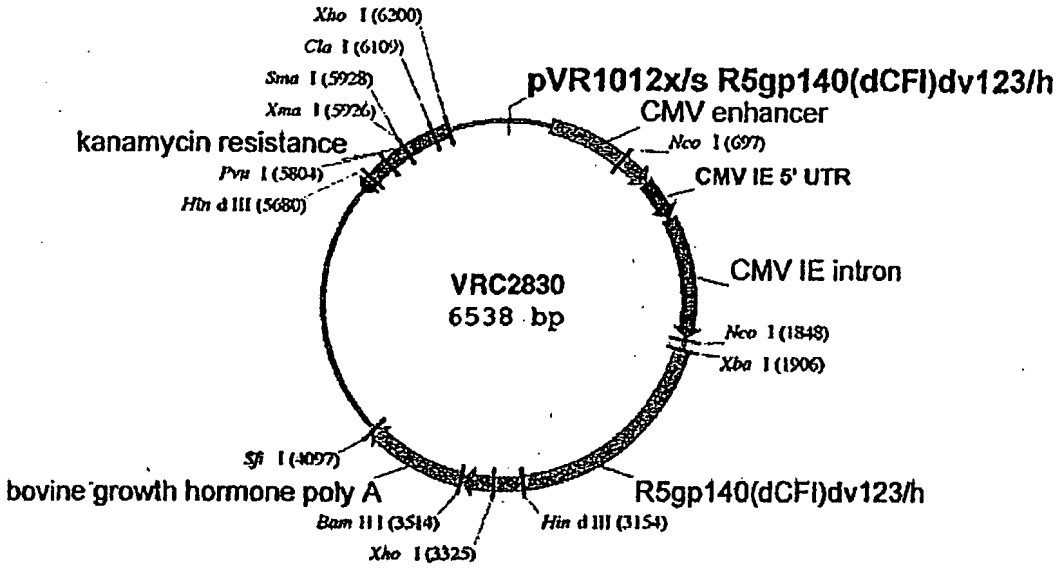

pVR1012x/s R5gp140(dCFI)dv123/h
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp140(dCFI)dv123/h
bovine growth hormone poly A
kanamycin resistance
VRC2830
6538 bp
Xho I (6300)
Cla I (6109)
Sma I (5928)
Xma I (5926)
Pvu I (5804)
Hin d III (5680)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (3097)
Bam III (3514)
Hin d III (3154)
Xho I (3325)

Figure 30

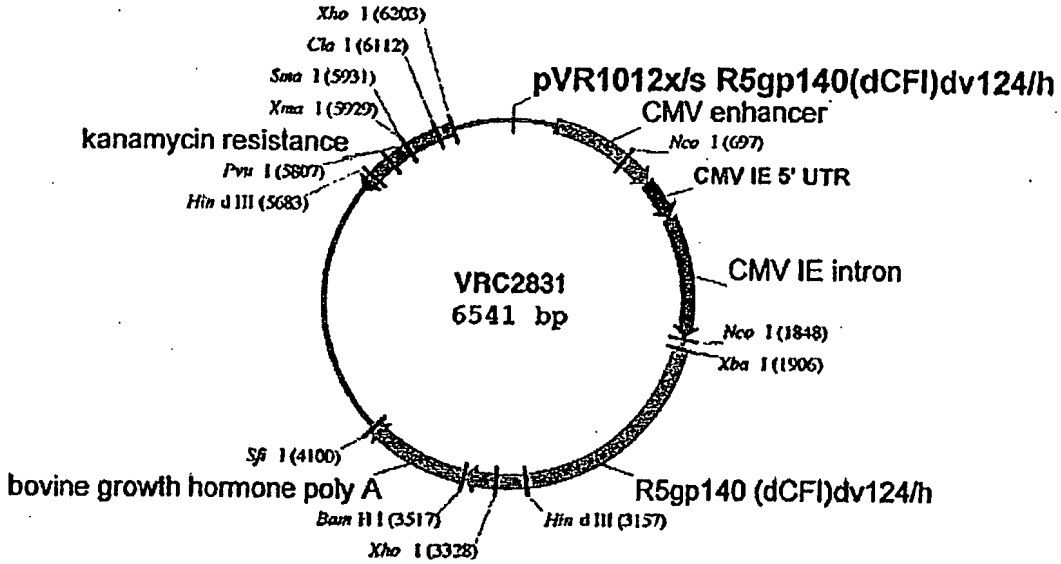

Xho I (6203)
Cla I (6112)
Sma I (5931)
Xma I (5929)
kanamycin resistance
Pvu I (5807)
Hin d III (5683)
pVR1012x/s R5gp140(dCFI)dv124/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2831
6541 bp
Nco I (1848)
Xba I (1906)
Sfi I (4100)
bovine growth hormone poly A
R5gp140 (dCFI)dv124/h
Bam H I (3517)
Hin d III (3157)
Xho I (3328)

Figure 31

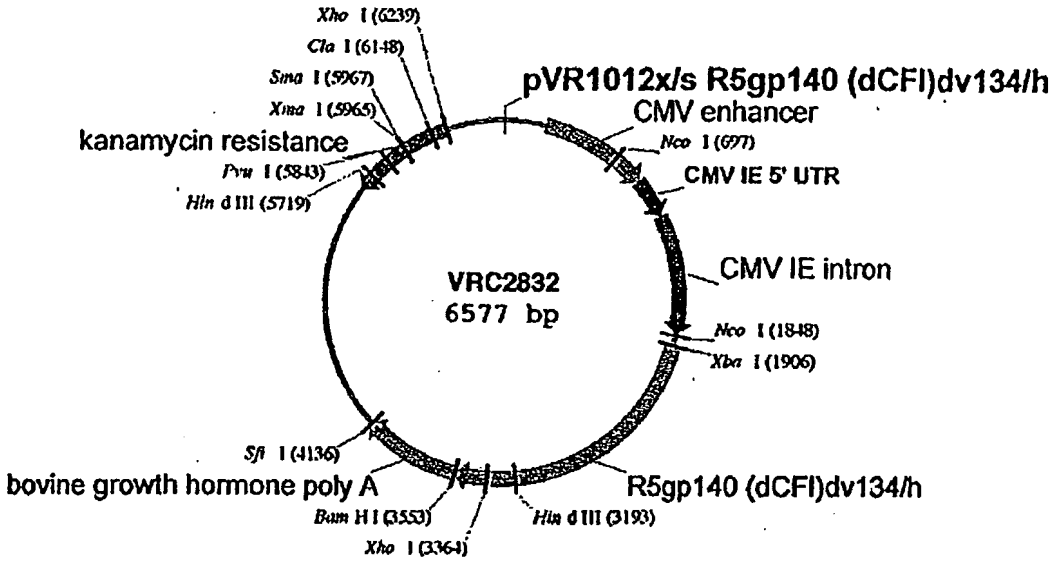

Xho I (6239)
Cla I (6148)
Sma I (5967)
Xma I (5965)
kanamycin resistance
Pvu I (5843)
Hin d III (5719)
pVR1012x/s R5gp140 (dCFI)dv134/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2832
6577 bp
Nco I (1848)
Xba I (1906)
Sfi I (4136)
bovine growth hormone poly A
Bam H I (3553)
Xho I (3364)
Hin d III (3193)
R5gp140 (dCFI)dv134/h

Figure 32

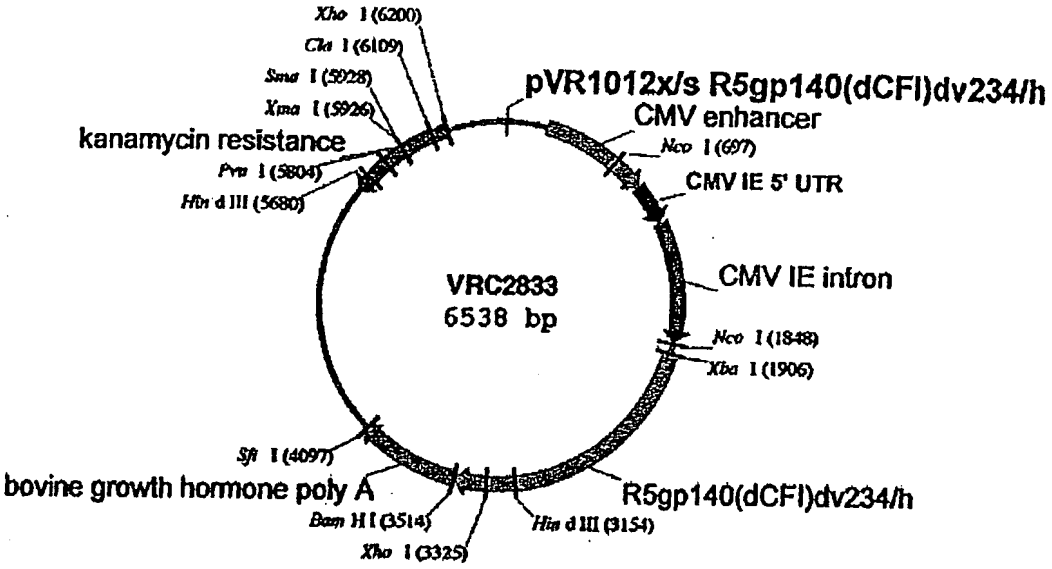

Xho I (6200)
Cla I (6109)
Sma I (5928)
Xma I (5926)
kanamycin resistance
Pvu I (5804)
Hin d III (5680)
pVR1012x/s R5gp140(dCFI)dv234/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2833
6538 bp
Nco I (1848)
Xba I (1906)
Sfi I (4097)
bovine growth hormone poly A
R5gp140(dCFI)dv234/h
Bam HI (3514)
Hin d III (3154)
Xho I (3325)

Figure 33

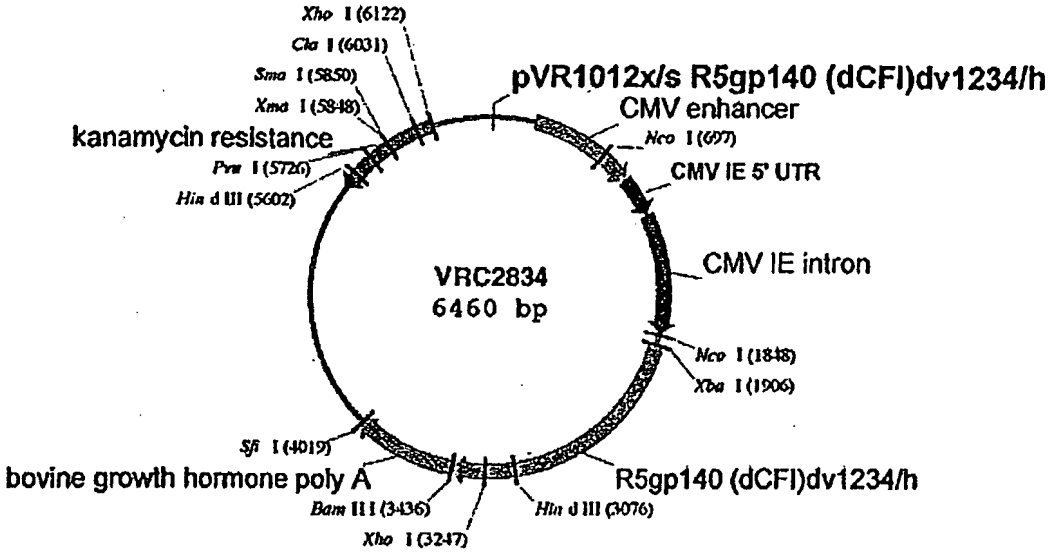

pVR1012x/s R5gp140 (dCFI)dv1234/h
VRC2834
6460 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp140 (dCFI)dv1234/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6122)
Cla I (6031)
Sma I (5850)
Xma I (5848)
Pvu I (5726)
Hin d III (5602)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4019)
Bam HI (3436)
Xho I (3247)
Hin d III (3076)

Figure 34

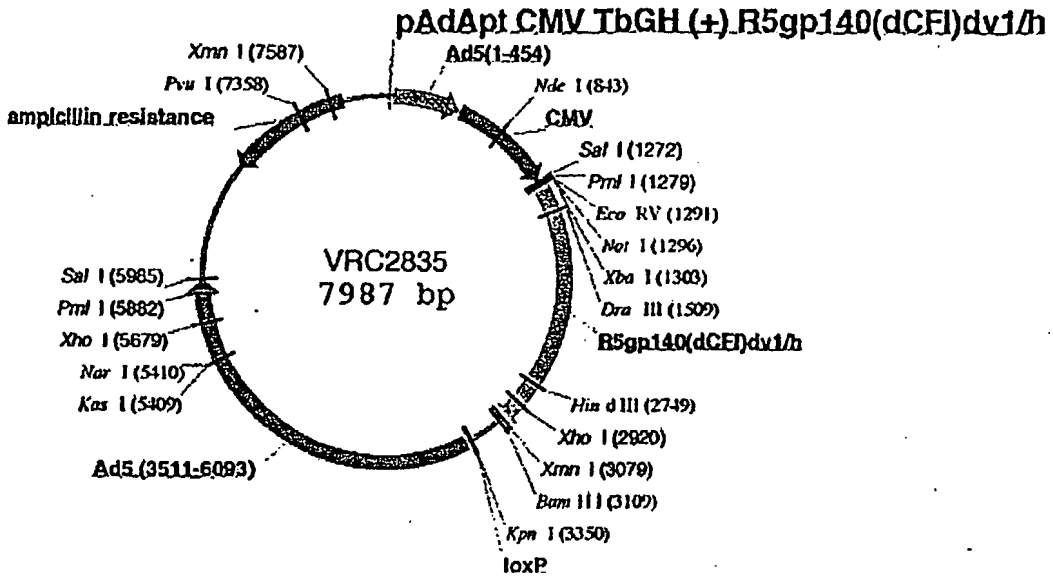

pAdApt CMV TbGH (+) R5gp140(dCFI)dv1/h
Xmn I (7587)
Ad5(1-454)
Pvu I (7358)
Nde I (843)
ampicillin resistance
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
VRC2835
7987 bp
Sal I (5985)
Dra III (1509)
Pml I (5882)
R5gp140(dCFI)dv1/h
Xho I (5679)
Nar I (5410)
Hin d III (2749)
Kas I (5409)
Xho I (2920)
Ad5 (3511-6093)
Xmn I (3079)
Bam HI (3109)
Kpn I (3350)
loxP

Figure 35

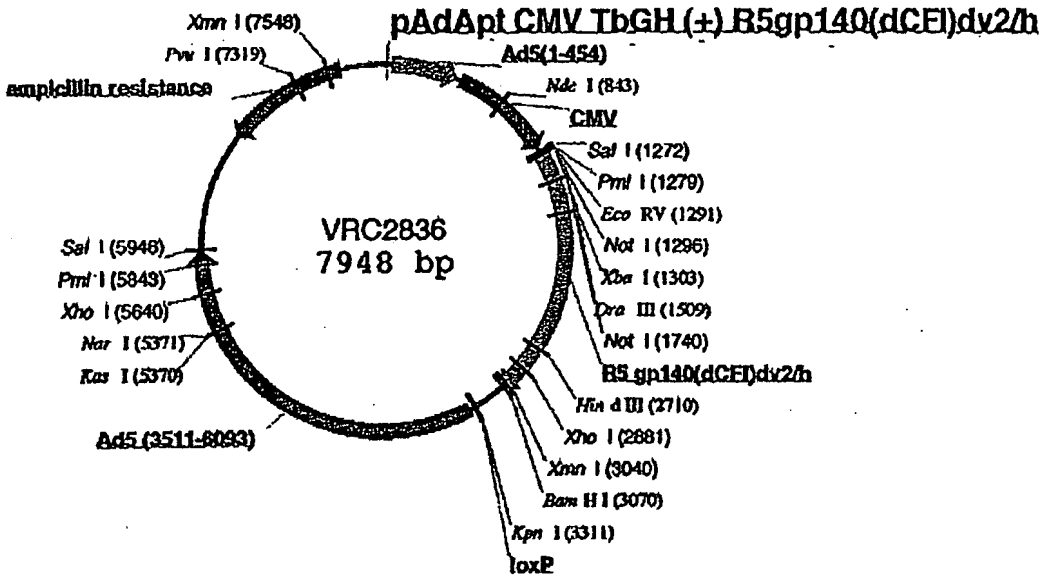

pAdApt CMV TbGH (+) R5gp140(dCFI)dv2/h
VRC2836
7948 bp
Xmn I (7548)
Pvu I (7319)
ampicillin resistance
Sal I (5948)
Pml I (5843)
Xho I (5640)
Nar I (5371)
Kas I (5370)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
Not I (1740)
R5 gp140(dCFI)dv2/h
Hin d III (2710)
Xho I (2681)
Xmn I (3040)
Bam H I (3070)
Kpn I (3311)
loxP

Figure 36

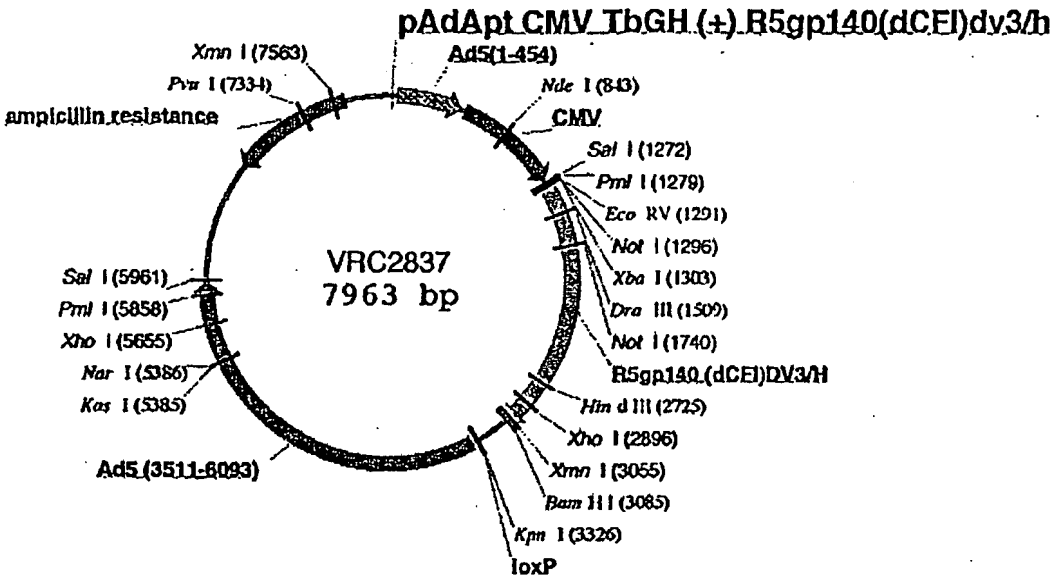

pAdApt CMV TbGH (+) R5gp140(dCFI)dv3/h
Xmn I (7563)
Ad5(1-454)
Pvu I (7334)
Nde I (843)
ampicillin resistance
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
VRC2837
7963 bp
Xba I (1303)
Sal I (5961)
Dra III (1509)
Pml I (5858)
Not I (1740)
Xho I (5655)
R5gp140 (dCFI)DV3/H
Nar I (5386)
Hin d III (2725)
Kas I (5385)
Xho I (2896)
Ad5 (3511-6093)
Xmn I (3055)
Bam III (3085)
Kpn I (3326)
loxP

Figure 37

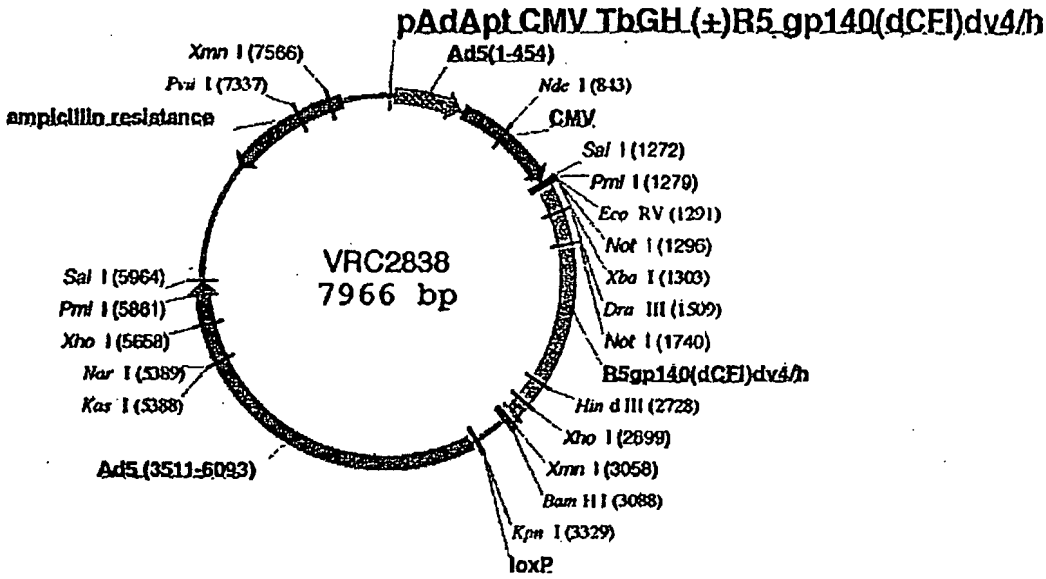

pAdApt CMV TbGH (±)R5 gp140(dCFI)dv4/h
VRC2838
7966 bp
Xmn I (7566)
Pvu I (7337)
ampicillin resistance
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
Not I (1740)
R5gp140(dCFI)dv4/h
Hin d III (2728)
Xho I (2899)
Xmn I (3058)
Bam H I (3088)
Kpn I (3329)
loxP
Sal I (5964)
Pml I (5881)
Xho I (5658)
Nar I (5389)
Kas I (5388)
Ad5 (3511-6093)

Figure 38

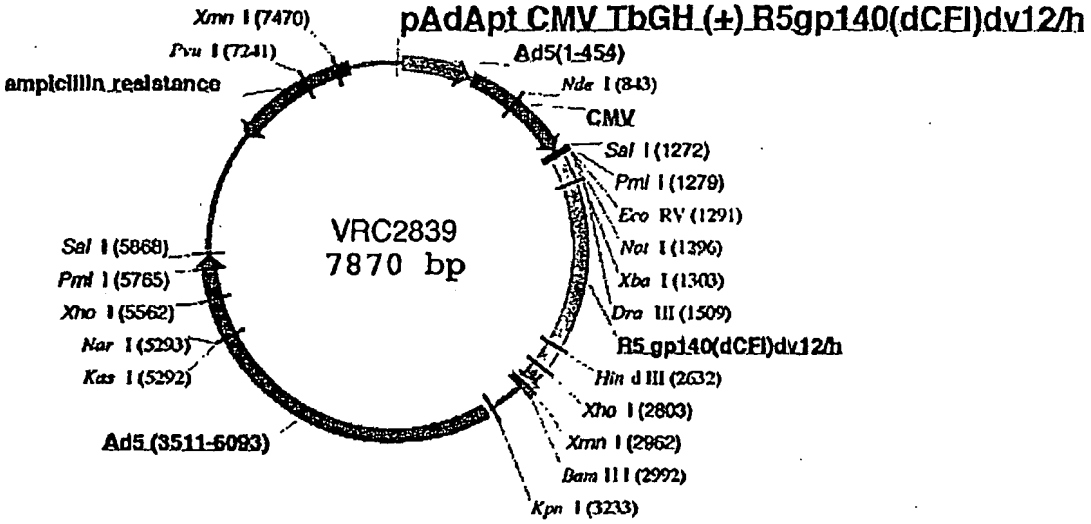

pAdApt CMV TbGH (±) R5gp140(dCFI)dv12/h
VRC2839
7870 bp
Xmn I (7470)
Pvu I (7241)
ampicillin realstance
Sal I (5868)
Pml I (5765)
Xho I (5562)
Nar I (5293)
Kas I (5292)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
R5 gp140(dCFI)dv12/h
Hin d III (2632)
Xho I (2803)
Xmn I (2962)
Bam III (2992)
Kpn I (3233)

Figure 39

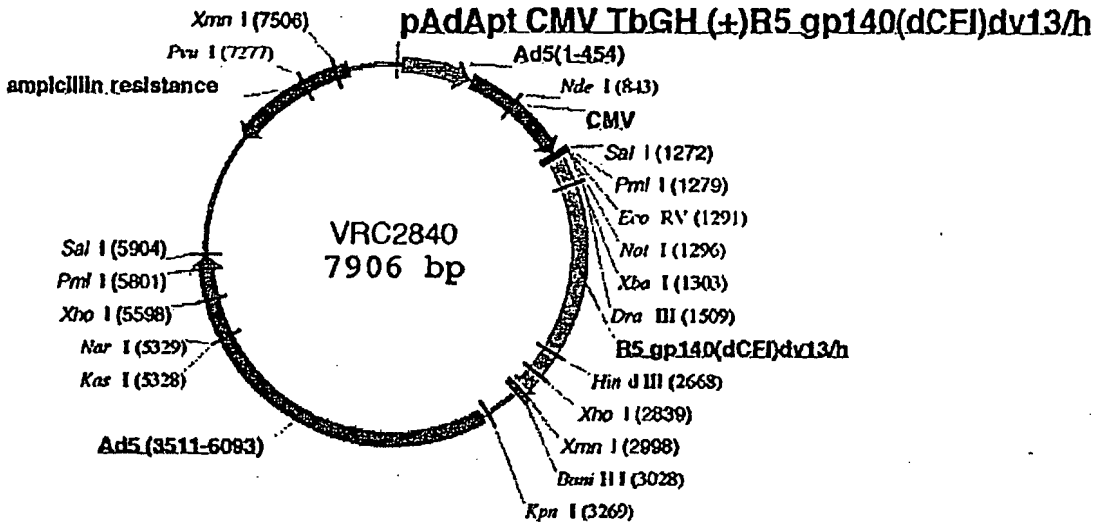

pAdApt CMV TbGH (+)R5 gp140(dCFI)dv13/h
VRC2840
7906 bp
Xmn I (7506)
Pvu I (7277)
ampicillin resistance
Sal I (5904)
Pml I (5801)
Xho I (5598)
Nar I (5329)
Kas I (5328)
Ad5 (3511-6083)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
R5 gp140(dCFI)dv13/h
Hin d III (2668)
Xho I (2839)
Xmn I (2898)
Bam H I (3028)
Kpn I (3269)

Figure 40

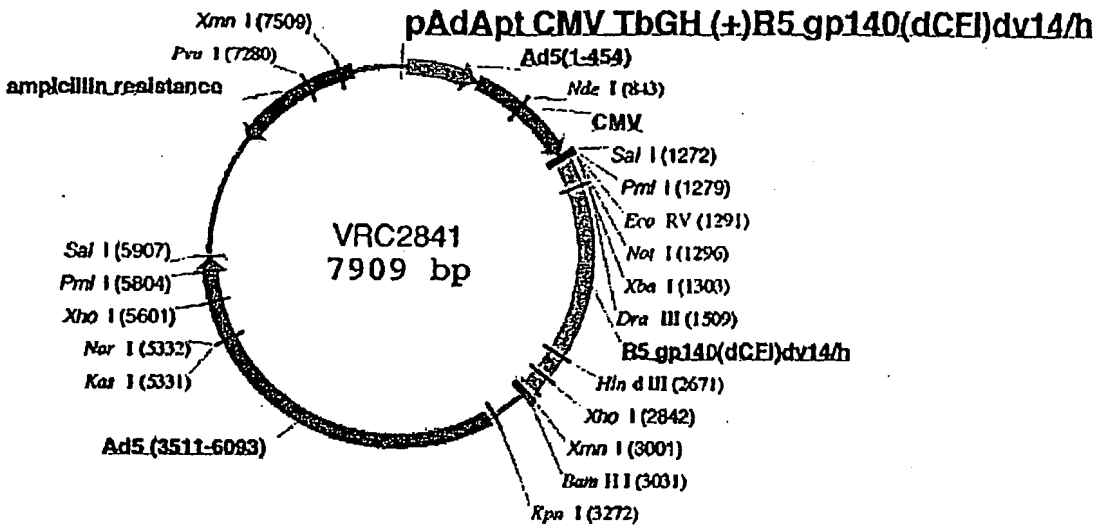

pAdApt CMV TbGH (+)R5 gp140(dCFI)dv14/h
VRC2841
7909 bp
Xmn I (7509)
Pvu I (7280)
ampicillin resistance
Sal I (5907)
Pml I (5804)
Xho I (5601)
Nar I (5332)
Kas I (5331)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
R5 gp140(dCFI)dv14/h
Hin d III (2671)
Xho I (2842)
Xmn I (3001)
Bam HI (3031)
Kpn I (3272)

Figure 41

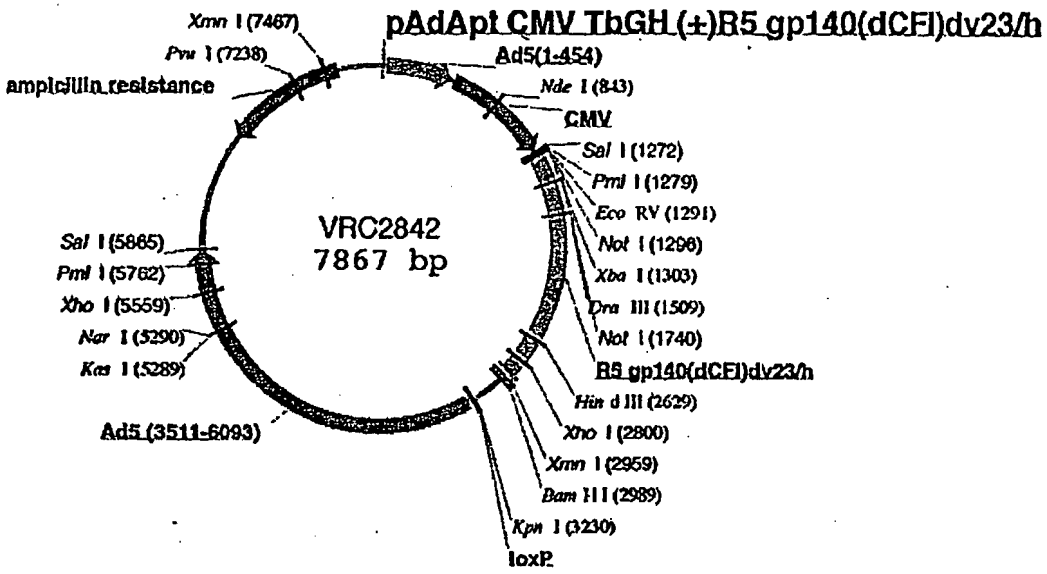

pAdApt CMV TbGH (±)R5 gp140(dCFI)dv23/h
VRC2842
7867 bp
Xmn I (7467)
Pvu I (7238)
ampicillin resistance
Sal I (5865)
Pml I (5762)
Xho I (5559)
Nar I (5290)
Kas I (5289)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1298)
Xba I (1303)
Dra III (1509)
Not I (1740)
R5 gp140(dCFI)dv23/h
Hin d III (2629)
Xho I (2800)
Xmn I (2959)
Bam HI (2989)
Kpn I (3230)
loxP

Figure 42

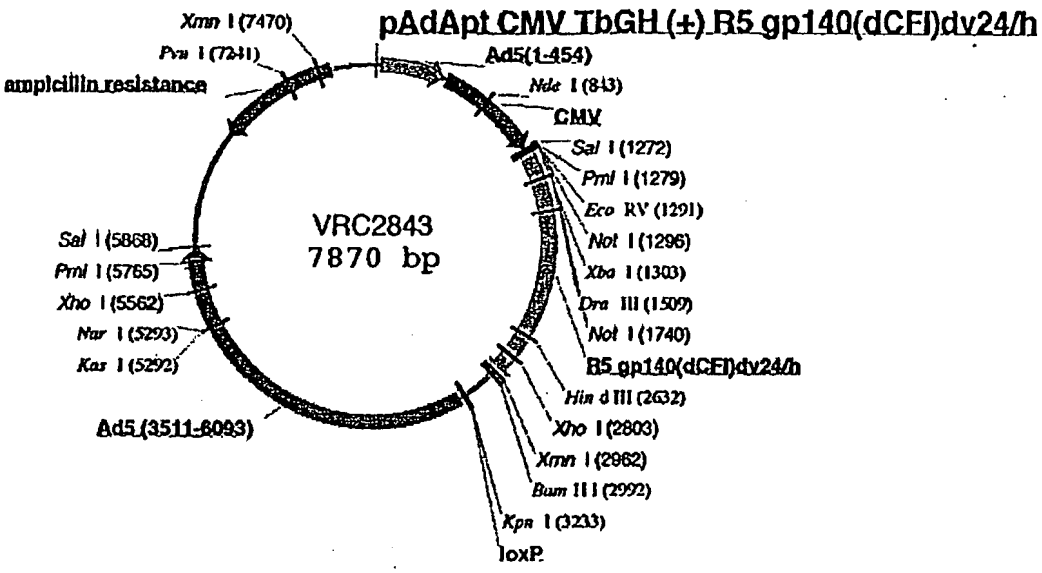

pAdApt CMV TbGH (+) R5 gp140(dCFI)dv24/h
VRC2843
7870 bp
Xmn I (7470)
Pvu I (7241)
ampicillin resistance
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
Not I (1740)
R5 gp140(dCFI)dv24/h
Hin d III (2632)
Xho I (2803)
Xmn I (2862)
Bam III (2992)
Xpa I (3233)
loxP
Ad5 (3511-6093)
Sal I (5868)
Pml I (5765)
Xho I (5562)
Nar I (5293)
Kas I (5292)

Figure 43

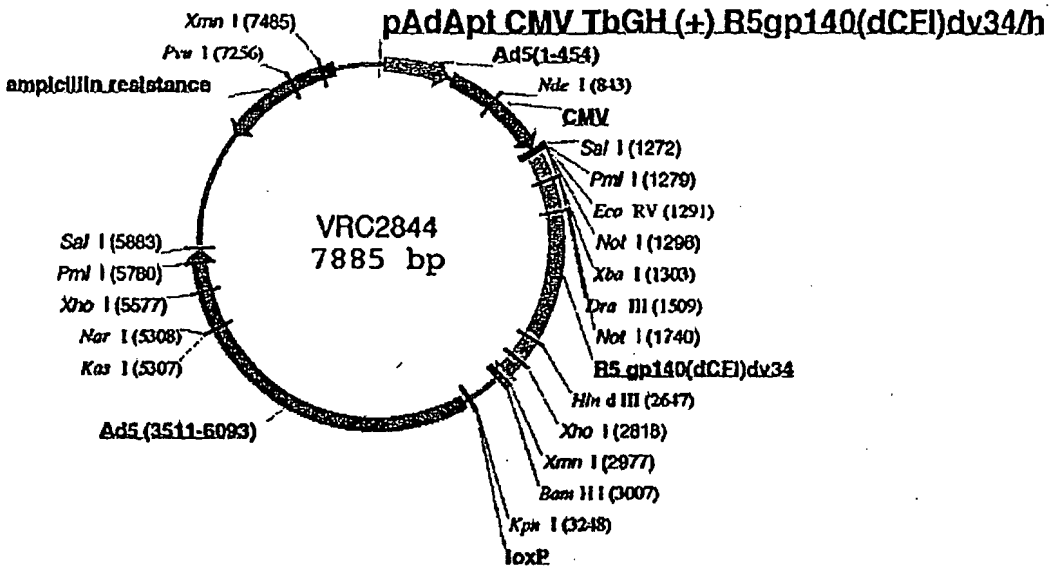

pAdApt CMV TbGH (+) B5gp140(dCFI)dv34/h
VRC2844
7885 bp
Xmn I (7485)
Pvu I (7256)
ampicillin resistance
Sal I (5883)
Pml I (5780)
Xho I (5577)
Nar I (5308)
Kas I (5307)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1298)
Xba I (1303)
Dra III (1509)
Not I (1740)
B5 gp140(dCFI)dv34
Hin d III (2647)
Xho I (2818)
Xmn I (2977)
Bam HI (3007)
Kpn I (3248)
loxP

Figure 44

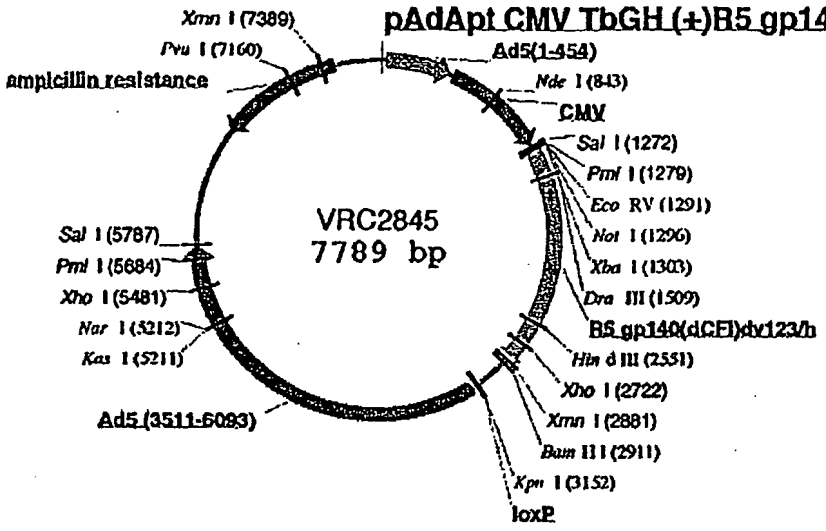

pAdApt CMV TbGH (+)B5 gp140(dCFI)dv123/h
VRC2845
7789 bp
Xmn I (7389)
Pvu I (7160)
ampicillin resistance
Sal I (5787)
Pml I (5684)
Xho I (5481)
Nar I (5212)
Kas I (5211)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
B5 gp140(dCFI)dv123/h
Hin d III (2551)
Xho I (2722)
Xmn I (2881)
Bam HI (2911)
Kpn I (3152)
loxP

Figure 45

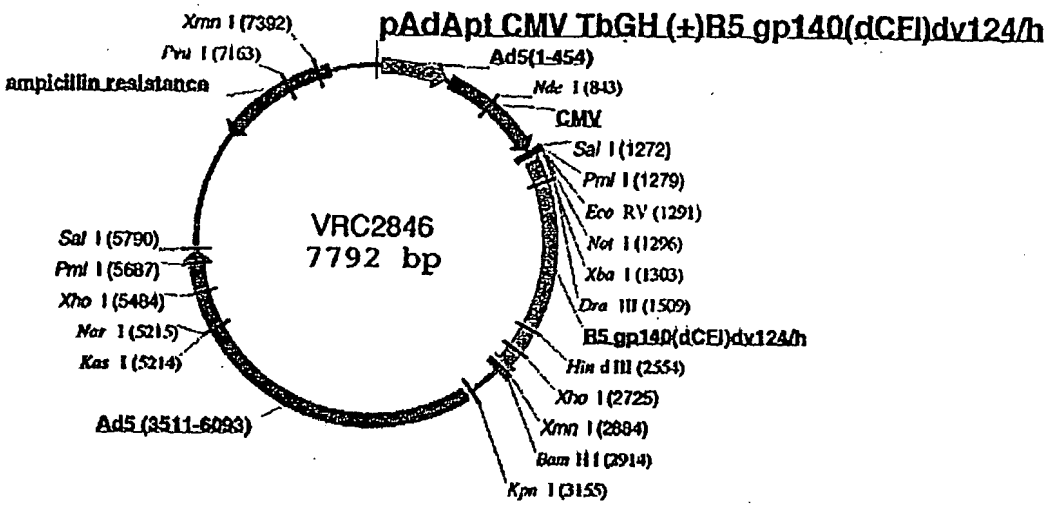

pAdApt CMV TbGH (+)B5 gp140(dCFI)dv124/h
VRC2846
7792 bp
Xmn I (7392)
Pvu I (7163)
ampicillin resistance
Sal I (5790)
Pml I (5687)
Xho I (5484)
Nar I (5215)
Kas I (5214)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
B5 gp140(dCFI)dv124/h
Hin d III (2554)
Xho I (2725)
Xmn I (2884)
Bam HI (2914)
Kpn I (3155)

Figure 46

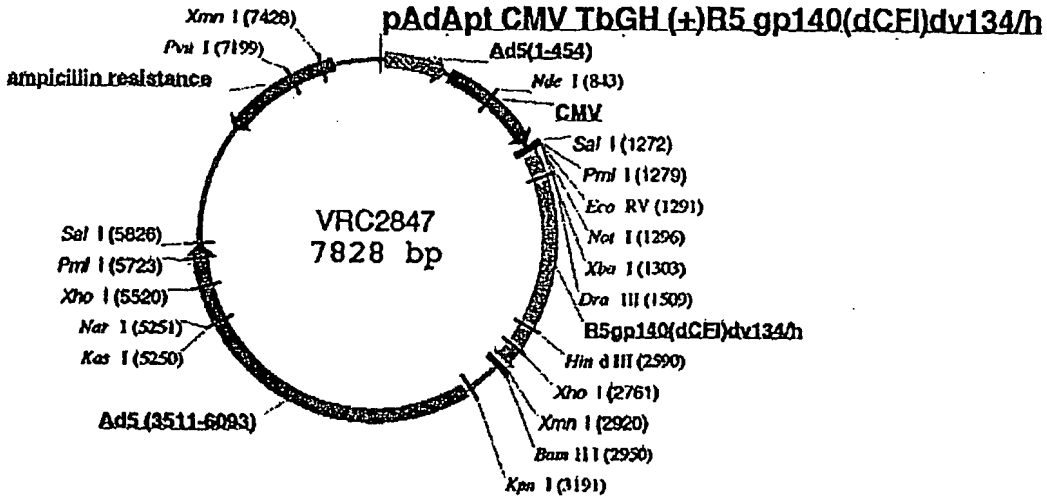

pAdApt CMV TbGH (+)B5 gp140(dCFI)dv134/h
VRC2847
7828 bp
Xmn I (7428)
Pvu I (7199)
ampicillin resistance
Sal I (5826)
Pml I (5723)
Xho I (5520)
Nar I (5251)
Kas I (5250)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
B5gp140(dCFI)dv134/h
Hin d III (2590)
Xho I (2761)
Xmn I (2920)
Bam HI (2950)
Kpn I (3191)

Figure 47

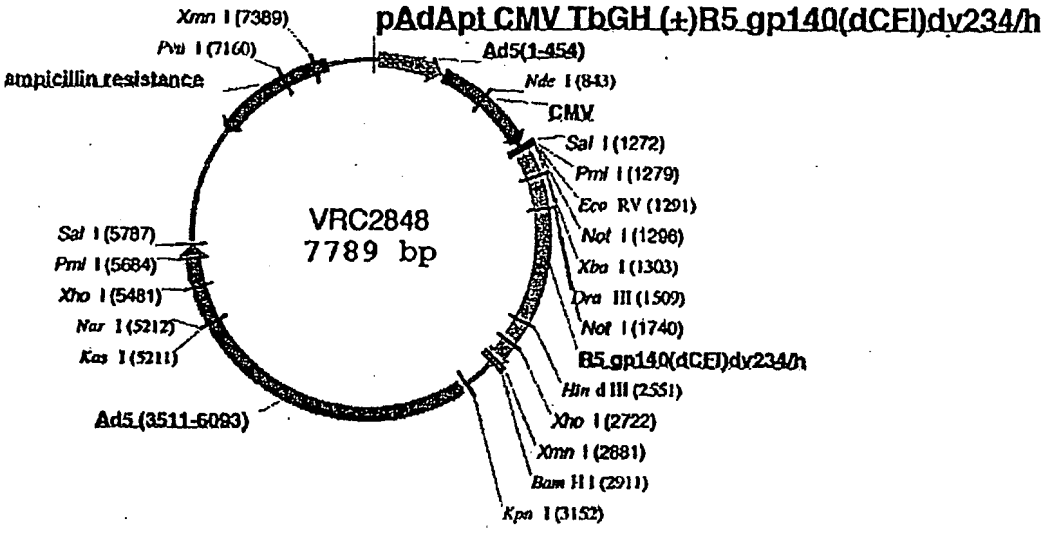

pAdApt CMV TbGH (+)B5 gp140(dCFI)dv234/h
VRC2848
7789 bp
Xmn I (7389)
Pvu I (7160)
ampicillin resistance
Sal I (5787)
Pml I (5684)
Xho I (5481)
Nar I (5212)
Kas I (5211)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
Not I (1740)
B5 gp140(dCFI)dv234/h
Hin d III (2551)
Xho I (2722)
Xmn I (2681)
Bam H I (2911)
Kpn I (3152)

Figure 48

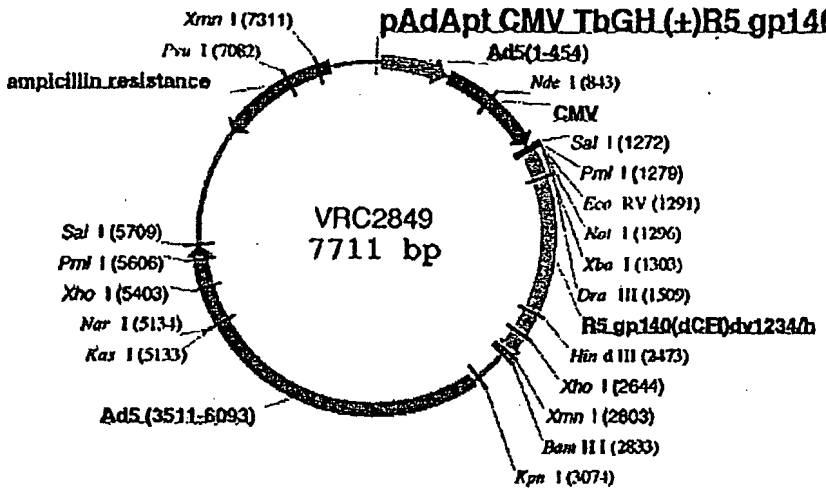

pAdApt CMV TbGH (+)R5 gp140(dCFI)dv1234/h
VRC2849
7711 bp
Xmn I (7311)
Pvu I (7082)
ampicillin resistance
Sal I (5709)
Pml I (5606)
Xho I (5403)
Nar I (5134)
Kas I (5133)
Ad5 (3511-6093)
Ad5(1-454)
Nde I (843)
CMV
Sal I (1272)
Pml I (1279)
Eco RV (1291)
Not I (1296)
Xba I (1303)
Dra III (1509)
R5 gp140(dCFI)dv1234/h
Hin d III (2473)
Xho I (2644)
Xmn I (2803)
Bam H I (2833)
Kpn I (3074)

Figure 49

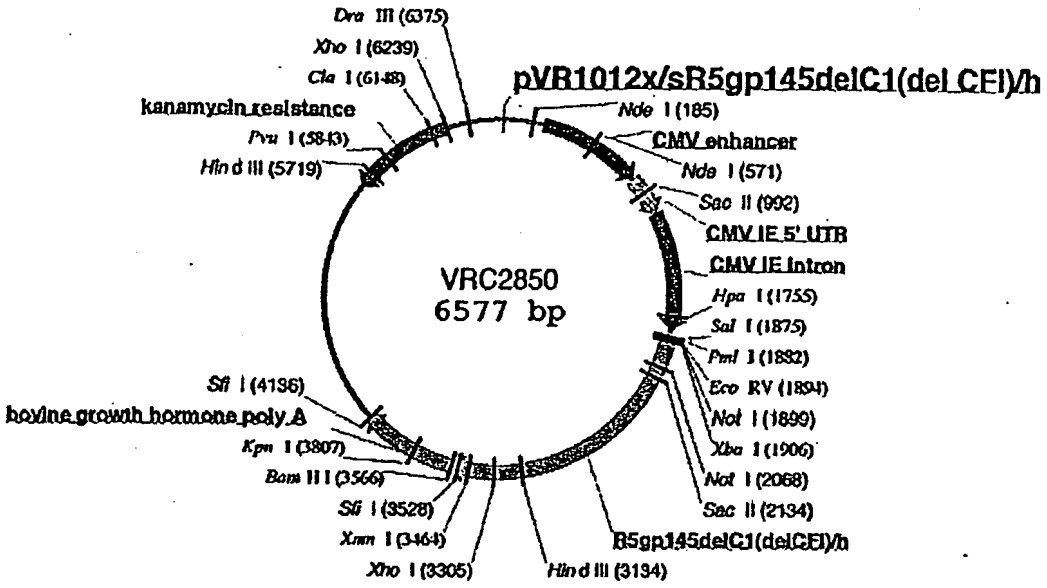

pVR1012x/sR5gp145delC1(delCFI)/h
VRC2850
6577 bp
Dra III (6375)
Xho I (6239)
Cla I (6148)
kanamycin resistance
Pvu I (5843)
Hind III (5719)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Not I (2068)
Sac II (2134)
R5gp145delC1(delCFI)/h
Hind III (3134)
Xho I (3305)
Xmn I (3464)
Sfi I (3528)
Bam HI (3566)
Kpn I (3807)
bovine growth hormone poly A
Sfi I (4136)

Figure 50

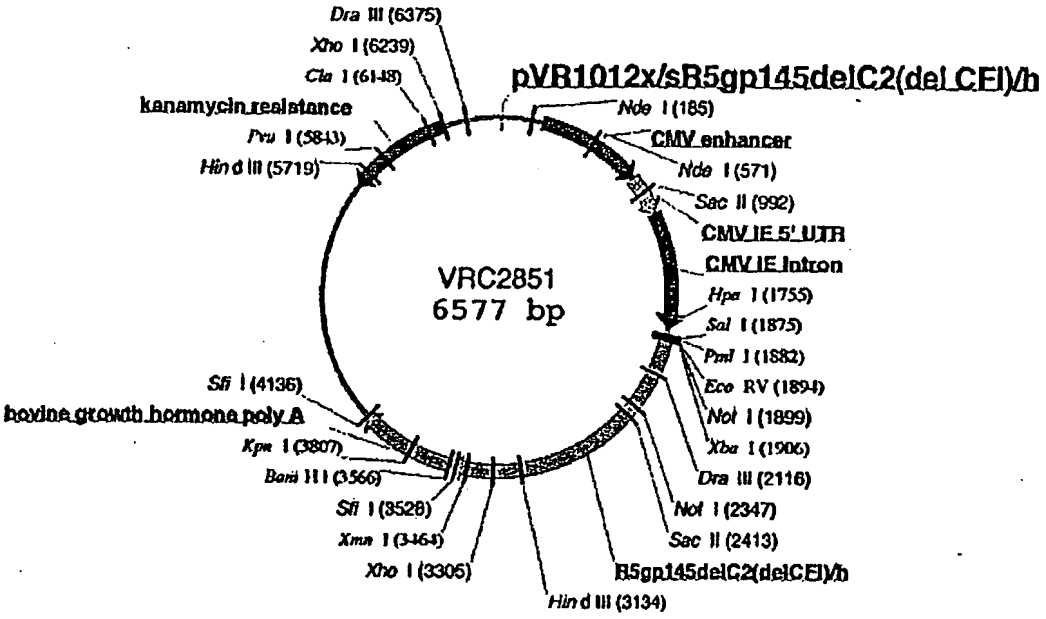

pVR1012x/sB5gp145delC2(delCFI)/h
VRC2851
6577 bp
Dra III (6375)
Xho I (6239)
Cla I (6148)
kanamycin resistance
Pvu I (5843)
Hind III (5719)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
B5gp145delC2(delCFI)/h
Hind III (3134)
Xho I (3305)
Xmn I (3464)
Sfi I (3528)
BamH I (3566)
Kpn I (3807)
bovine growth hormone poly A
Sfi I (4136)

Figure 51

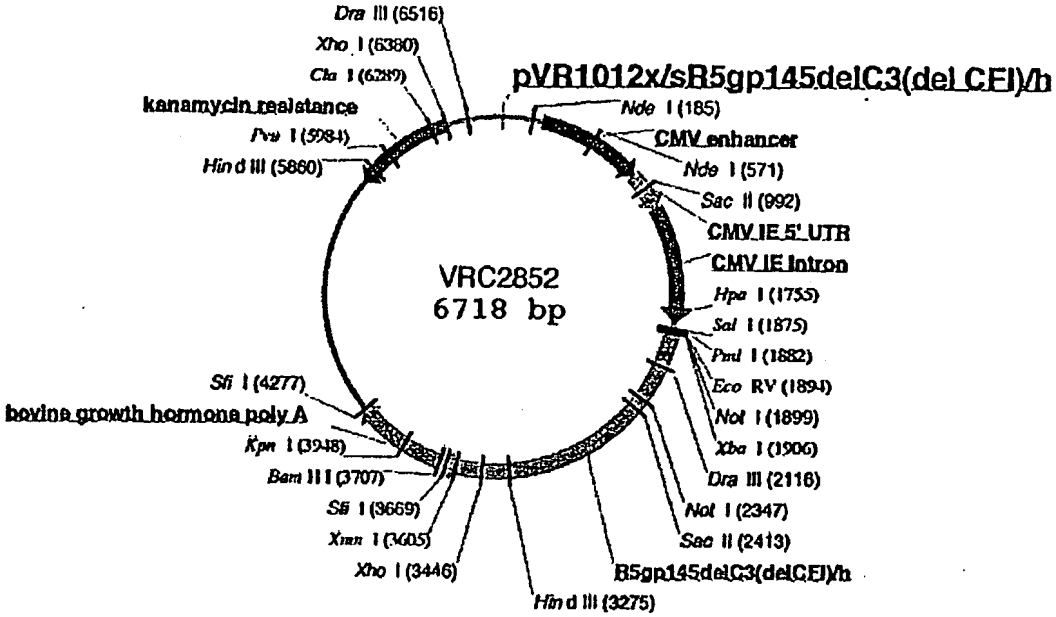

pVR1012x/sR5gp145delC3(delCFI)/h
VRC2852
6718 bp
Dra III (6516)
Xho I (6380)
Cla I (6289)
kanamycin resistance
Pvu I (5984)
Hind III (5880)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
B5gp145delC3(delCFI)/h
Hind III (3275)
Xho I (3446)
Xmn I (3605)
Sfi I (3669)
Bam HI (3707)
Kpn I (3948)
bovine growth hormone poly A
Sfi I (4277)

Figure 52

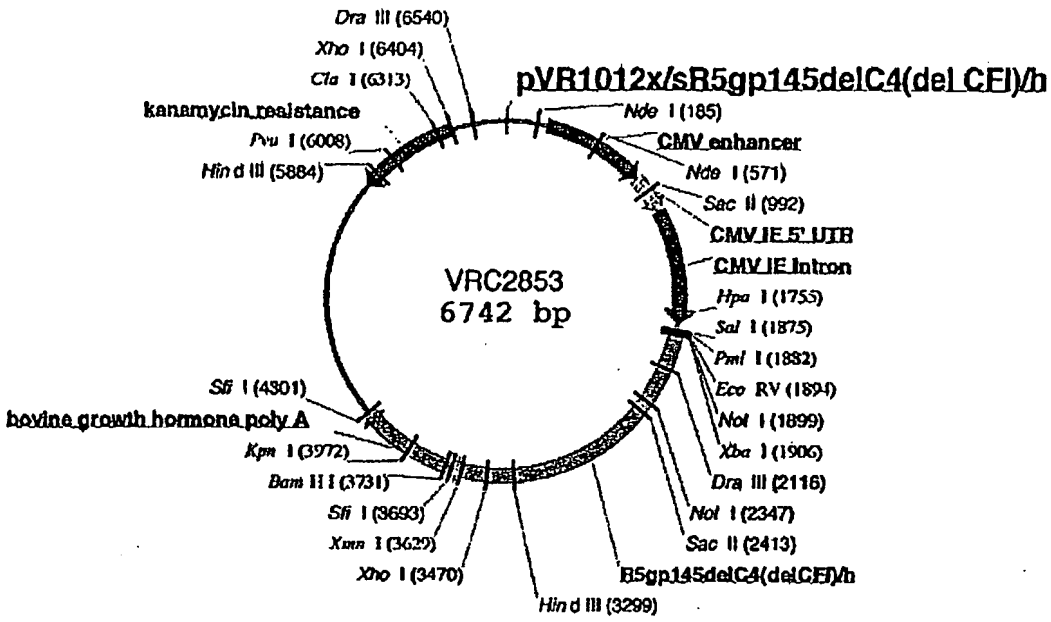

pVR1012x/sR5gp145delC4(delCFI)/h
VRC2853
6742 bp
Dra III (6540)
Xho I (6404)
Cla I (6313)
kanamycin resistance
Pvu I (6008)
Hind III (5884)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
R5gp145delC4(delCFI)/h
Hind III (3299)
Xho I (3470)
Xmn I (3629)
Sfi I (3693)
Bam HI (3731)
Kpn I (3972)
Sfi I (4301)
bovine growth hormone poly A

Figure 53

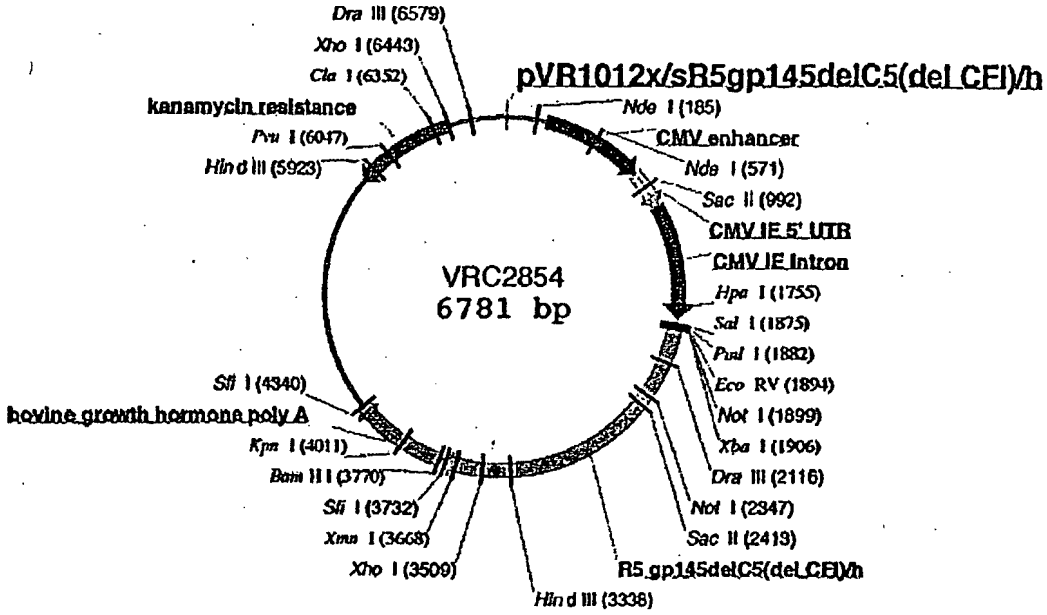

pVR1012x/sR5gp145delC5(del CFI)/h
VRC2854
6781 bp
Dra III (6579)
Xho I (6443)
Cla I (6352)
kanamycin resistance
Pvu I (6047)
Hind III (5923)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
PuvI I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sac II (2413)
R5 gp145delC5(del CFI)/h
Hind III (3338)
Xho I (3509)
Xmn I (3668)
Sfi I (3732)
Bam III (3770)
Kpn I (4011)
bovine growth hormone poly A
Sfi I (4340)

Figure 54

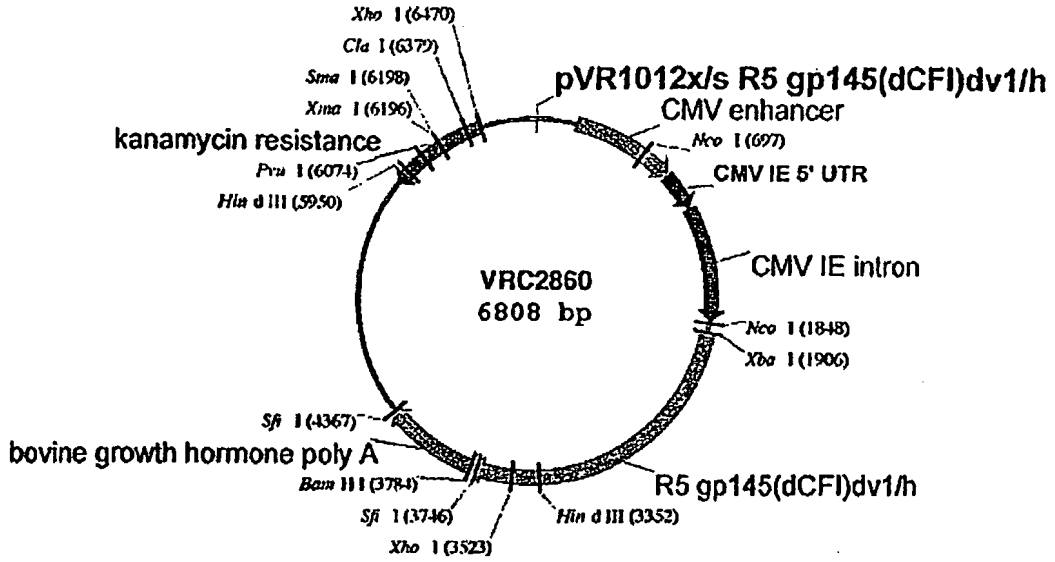

pVR1012x/s R5 gp145(dCFI)dv1/h
VRC2860
6808 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5 gp145(dCFI)dv1/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6470)
Cla I (6379)
Sma I (6198)
Xma I (6196)
Pvu I (6074)
Hin d III (5950)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4367)
Bam HI (3784)
Sfi I (3746)
Xho I (3523)
Hin d III (3352)

Figure 55

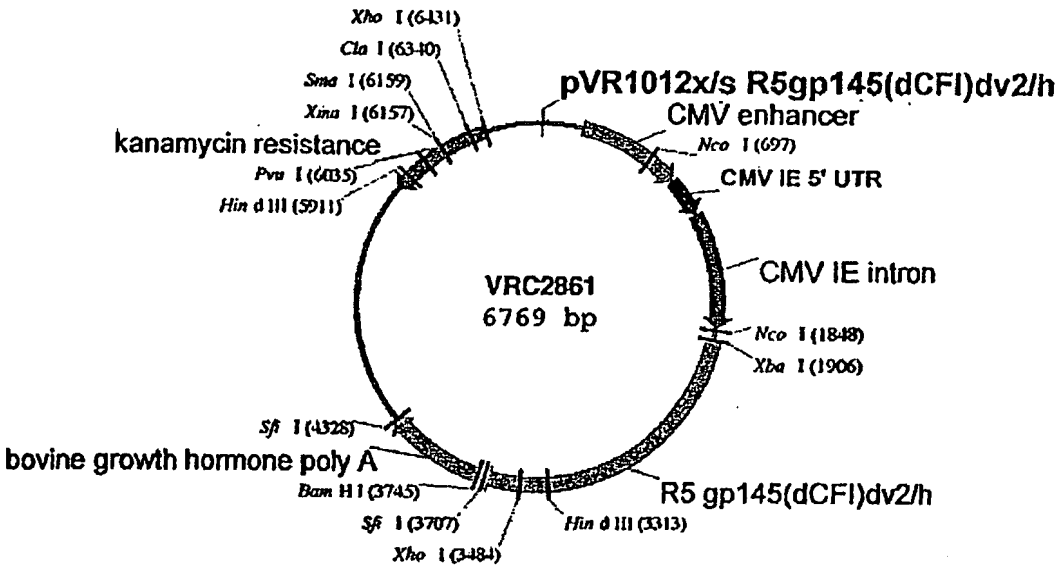

pVR1012x/s R5gp145(dCFI)dv2/h
VRC2861
6769 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5 gp145(dCFI)dv2/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6431)
Cla I (6310)
Sma I (6159)
Xma I (6157)
Pvu I (6035)
Hin d III (5911)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4328)
Bam H I (3745)
Sfi I (3707)
Xho I (3484)
Hin d III (3313)

Figure 56

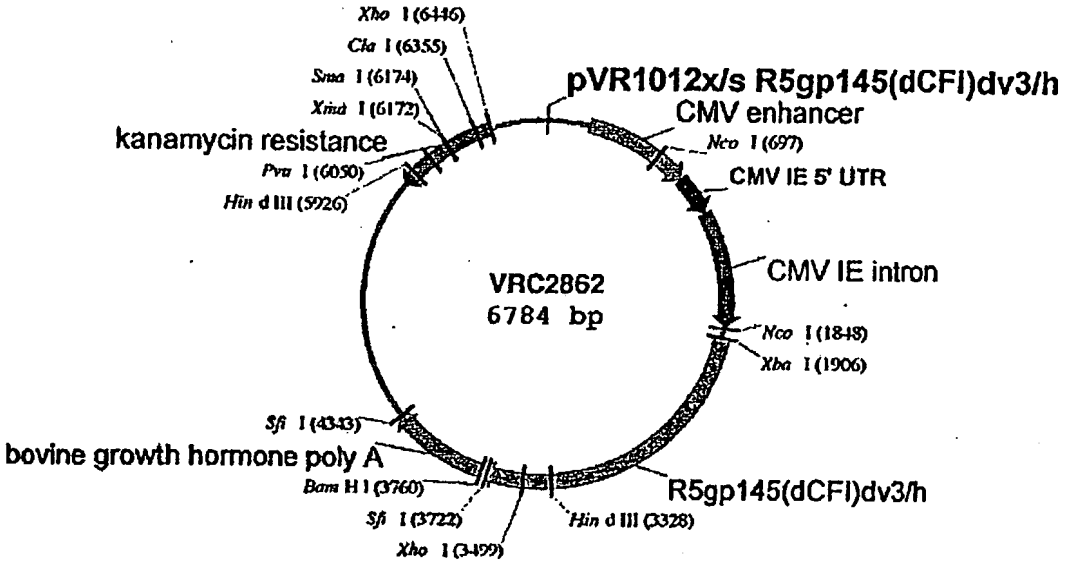

pVR1012x/s R5gp145(dCFI)dv3/h
VRC2862
6784 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv3/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6446)
Cla I (6355)
Sma I (6174)
Xma I (6172)
Pvu I (6050)
Hin d III (5926)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4343)
Bam H I (3760)
Sfi I (3722)
Xho I (3499)
Hin d III (3328)

Figure 57

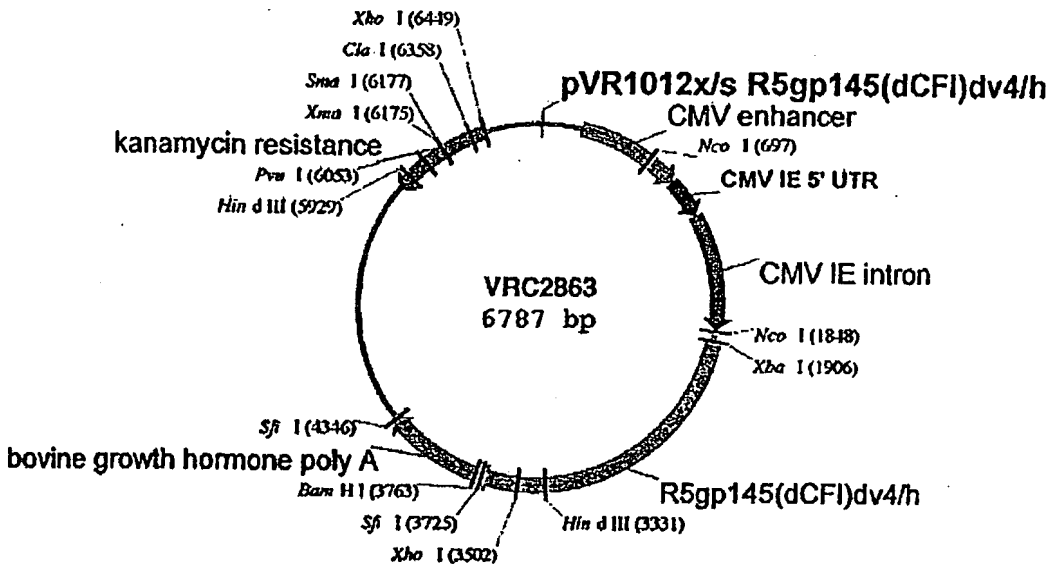

pVR1012x/s R5gp145(dCFI)dv4/h
VRC2863
6787 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv4/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6449)
Cla I (6358)
Sma I (6177)
Xma I (6175)
Pvu I (6053)
Hin d III (5929)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4346)
Bam H I (3763)
Sfi I (3725)
Xho I (3502)
Hin d III (3331)

Figure 58

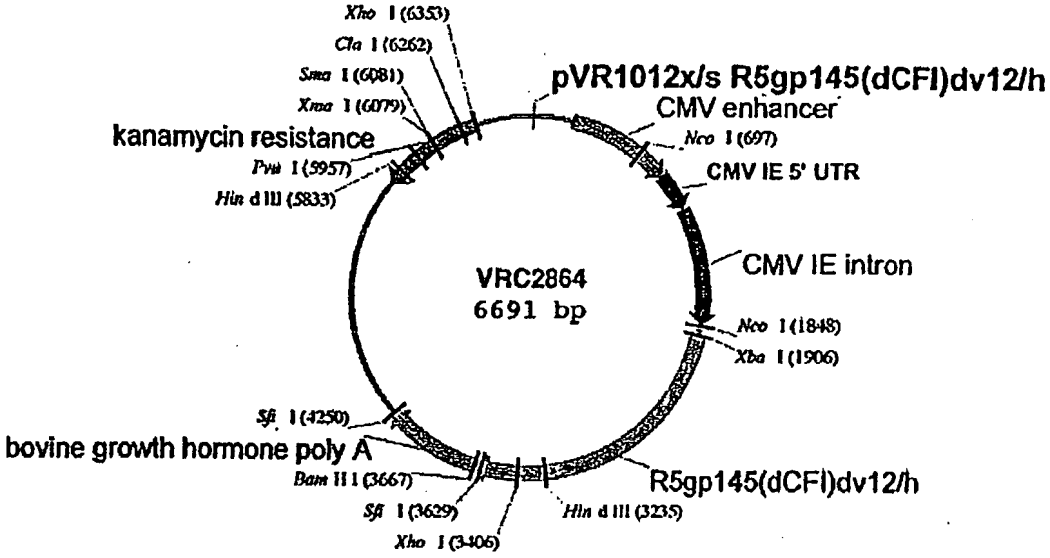

Xho I (6353)
Cla I (6262)
Sma I (6081)
Xma I (6079)
kanamycin resistance
Pvu I (5957)
Hin d III (5833)
pVR1012x/s R5gp145(dCFI)dv12/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2864
6691 bp
Nco I (1848)
Xba I (1906)
Sfi I (4250)
bovine growth hormone poly A
Bam HI (3667)
Sfi I (3629)
Xho I (3406)
Hin d III (3235)
R5gp145(dCFI)dv12/h

Figure 59

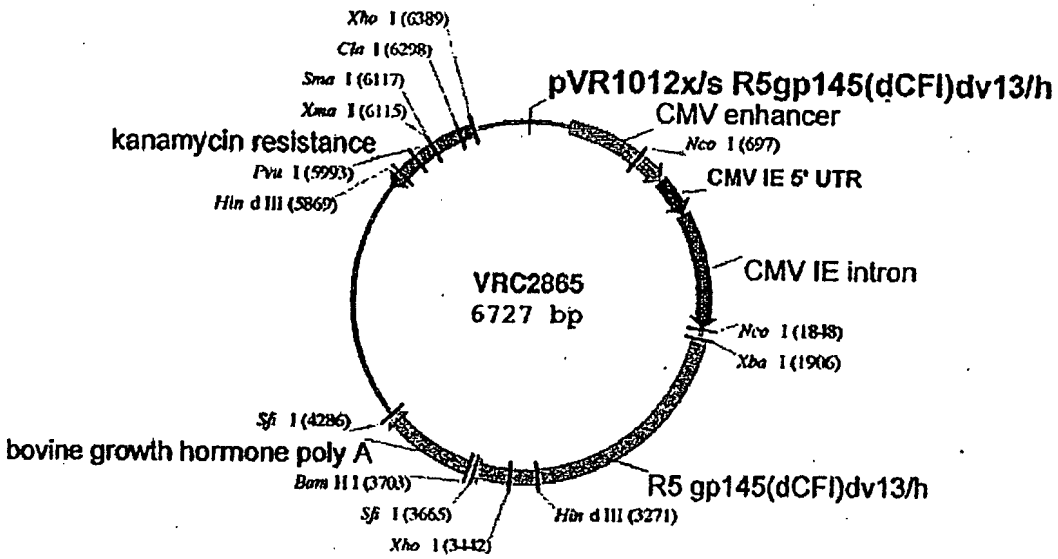

pVR1012x/s R5gp145(dCFI)dv13/h
VRC2865
6727 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5 gp145(dCFI)dv13/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6389)
Cla I (6298)
Sma I (6117)
Xma I (6115)
Pvu I (5993)
Hin d III (5869)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4286)
Bam H I (3703)
Sfi I (3665)
Hin d III (3271)
Xho I (3142)

Figure 60

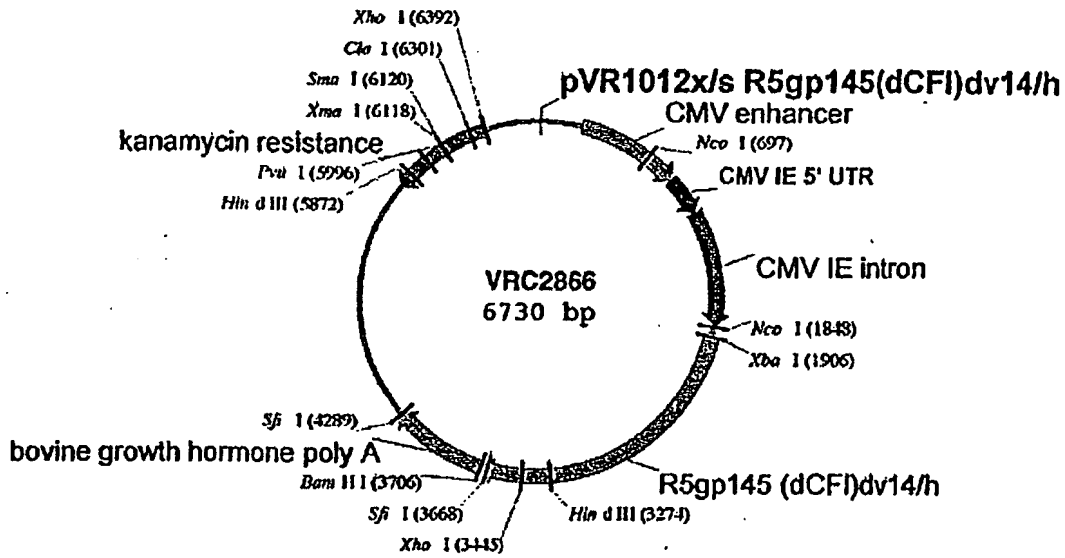

pVR1012x/s R5gp145(dCFI)dv14/h
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145 (dCFI)dv14/h
bovine growth hormone poly A
kanamycin resistance
VRC2866
6730 bp
Xho I (6392)
Cla I (6301)
Sma I (6120)
Xma I (6118)
Pvu I (5996)
Hin d III (5872)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4289)
Bam H I (3706)
Sfi I (3668)
Xho I (3445)
Hin d III (3274)

Figure 61

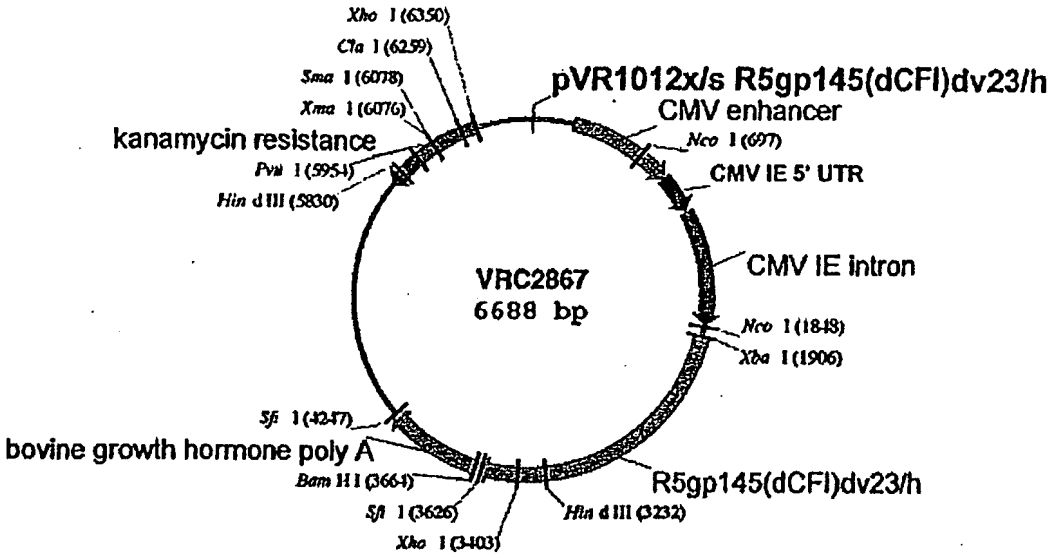

pVR1012x/s R5gp145(dCFI)dv23/h
VRC2867
6688 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv23/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6350)
Cla I (6259)
Sma I (6078)
Xma I (6076)
Pvu I (5954)
Hin d III (5830)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4247)
Bam H I (3664)
Sfi I (3626)
Xho I (3403)
Hin d III (3232)

Figure 62

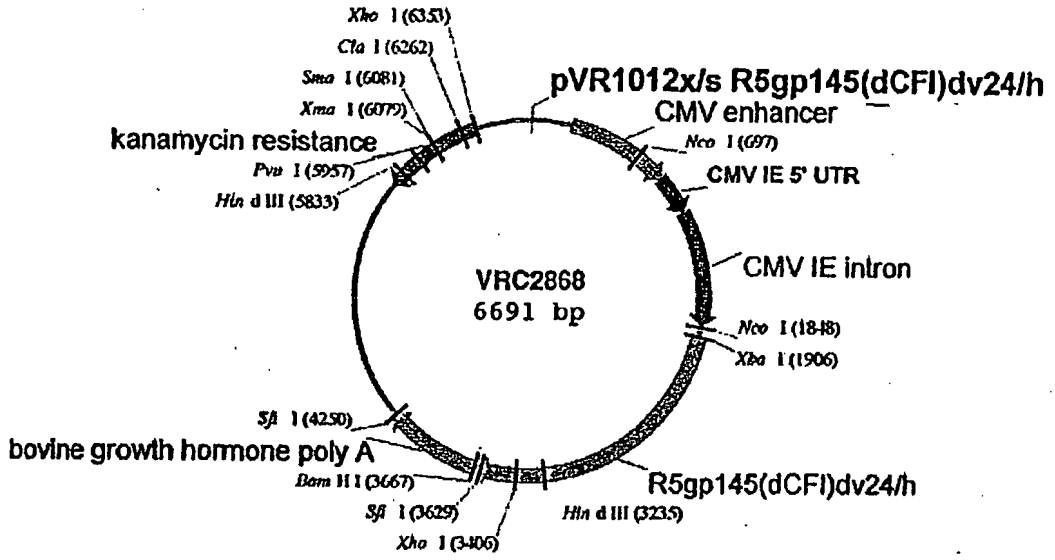

pVR1012x/s R5gp145(dCFI)dv24/h
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv24/h
bovine growth hormone poly A
kanamycin resistance
VRC2868
6691 bp
Xho I (6351)
Cla I (6262)
Sma I (6081)
Xma I (6079)
Pvu I (5957)
Hin d III (5833)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4250)
Bam H I (3667)
Sfi I (3629)
Xho I (3406)
Hin d III (3235)

Figure 63

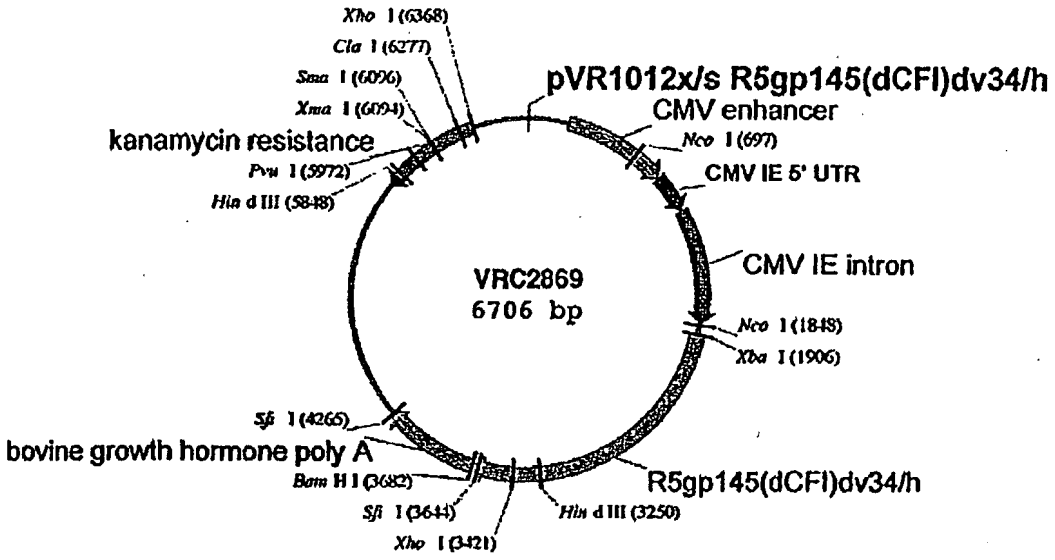

pVR1012x/s R5gp145(dCFI)dv34/h
VRC2869
6706 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv34/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6368)
Cla I (6277)
Sma I (6096)
Xma I (6094)
Pvu I (5972)
Hin d III (5848)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4265)
Bam H I (3682)
Sfi I (3644)
Xho I (3421)
Hin d III (3250)

Figure 64

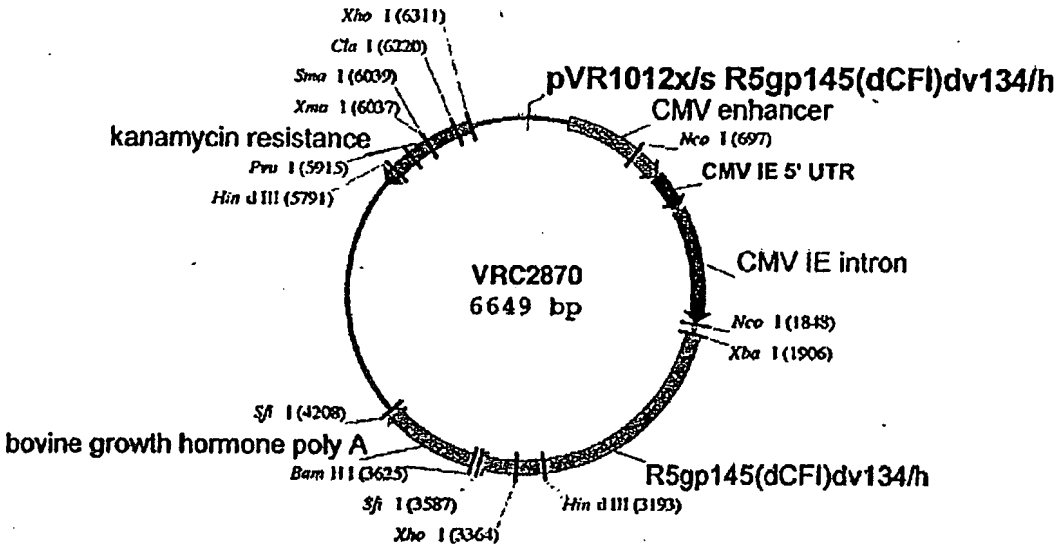

Xho I (6311)
Cla I (6220)
Sma I (6039)
Xma I (6037)
pVR1012x/s R5gp145(dCFI)dv134/h
CMV enhancer
kanamycin resistance
Nco I (697)
Pvu I (5915)
CMV IE 5' UTR
Hin d III (5791)
CMV IE intron
VRC2870
6649 bp
Nco I (1845)
Xba I (1906)
Sfi I (4208)
bovine growth hormone poly A
Bam HI (3625)
R5gp145(dCFI)dv134/h
Sfi I (3587)
Hin d III (3193)
Xho I (3364)

Figure 65

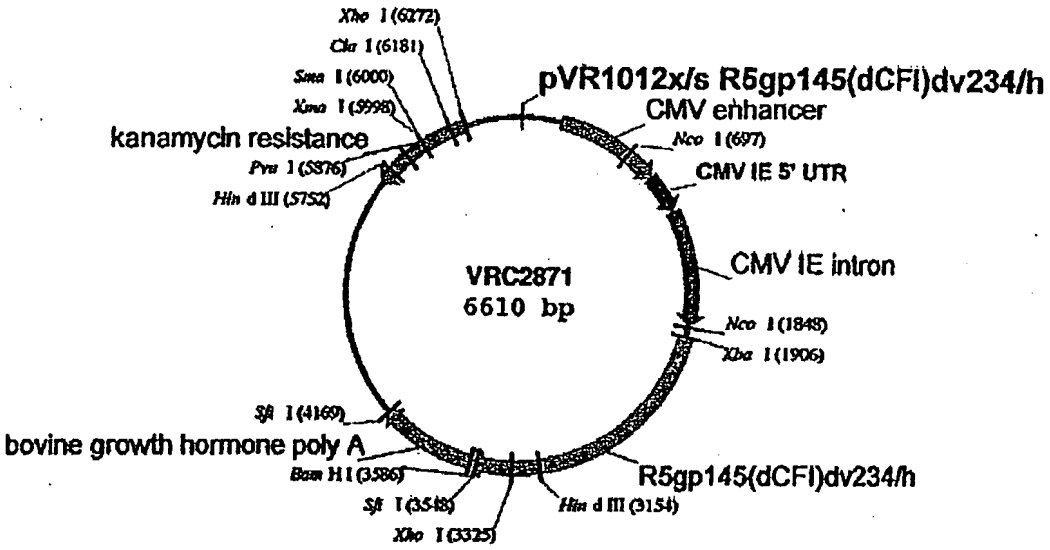

pVR1012x/s R5gp145(dCFI)dv234/h
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv234/h
bovine growth hormone poly A
kanamycin resistance
VRC2871
6610 bp
Xho I (6272)
Cla I (6181)
Sma I (6000)
Xma I (5998)
Pvu I (5876)
Hin d III (5752)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4169)
Bam H I (3586)
Sfi I (3548)
Xho I (3325)
Hin d III (3154)

Figure 66

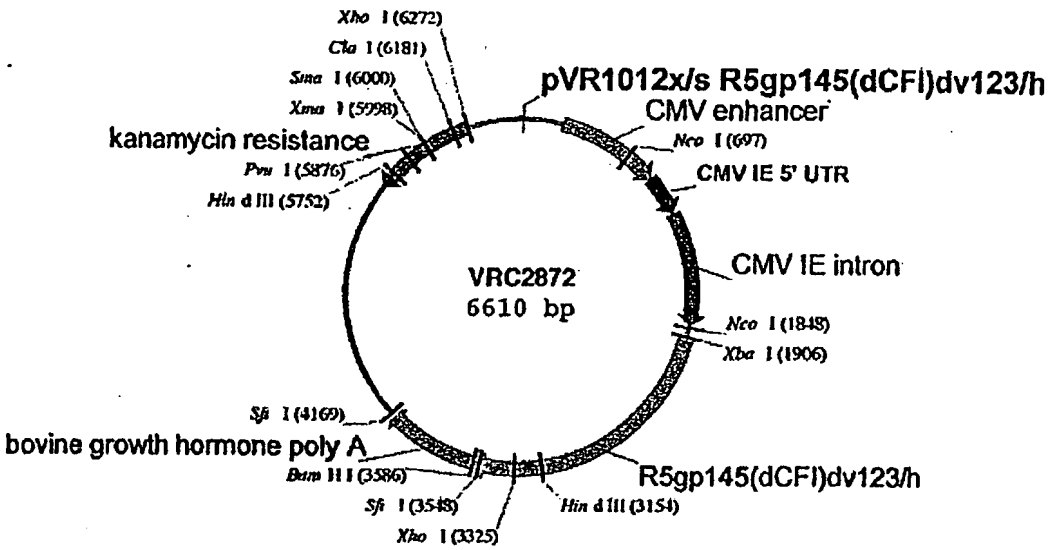

pVR1012x/s R5gp145(dCFI)dv123/h
VRC2872
6610 bp
CMV enhancer
CMV IE 5' UTR
CMV IE intron
R5gp145(dCFI)dv123/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6272)
Cla I (6181)
Sma I (6000)
Xma I (5998)
Pvu I (5876)
Hin d III (5752)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4169)
Bam HI (3586)
Sfi I (3548)
Xho I (3325)
Hin d III (3154)

Figure 67

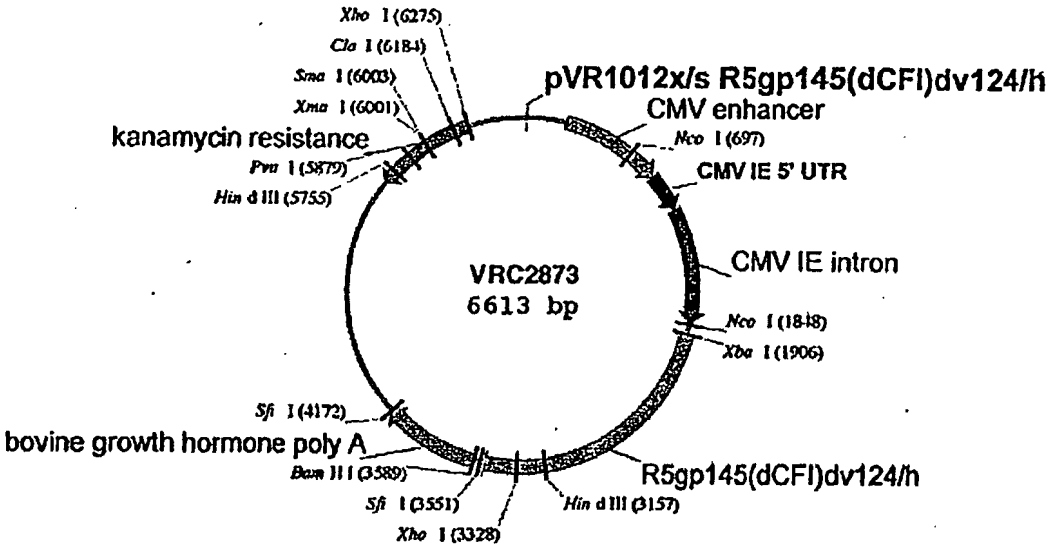

Xho I (6275)
Cla I (6184)
Sma I (6003)
Xma I (6001)
kanamycin resistance
Pvu I (5879)
Hin d III (5755)
pVR1012x/s R5gp145(dCFI)dv124/h
CMV enhancer
Nco I (697)
CMV IE 5' UTR
CMV IE intron
VRC2873
6613 bp
Nco I (1848)
Xba I (1906)
Sfi I (4172)
bovine growth hormone poly A
Bam HI (3589)
Sfi I (3551)
Xho I (3328)
Hin d III (3157)
R5gp145(dCFI)dv124/h

Figure 68

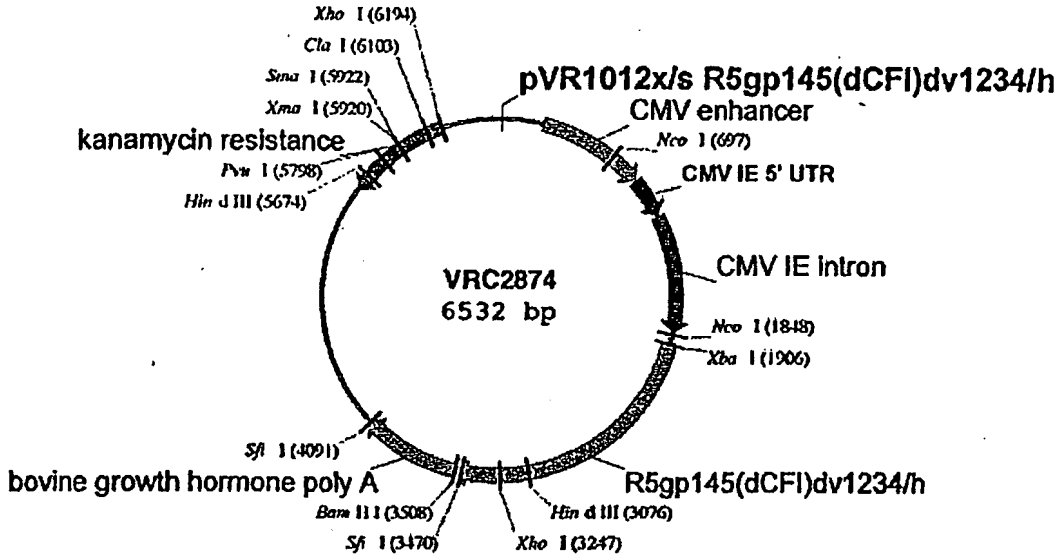

pVR1012x/s R5gp145(dCFI)dv1234/h
VRC2874
6532 bp
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
R5gp145(dCFI)dv1234/h
bovine growth hormone poly A
kanamycin resistance
Xho I (6194)
Cla I (6103)
Sma I (5922)
Xma I (5920)
Pvu I (5798)
Hin d III (5674)
Nco I (697)
Nco I (1848)
Xba I (1906)
Sfi I (4091)
Bam HI (3508)
Sfi I (3470)
Hin d III (3076)
Xho I (3247)

Figure 69

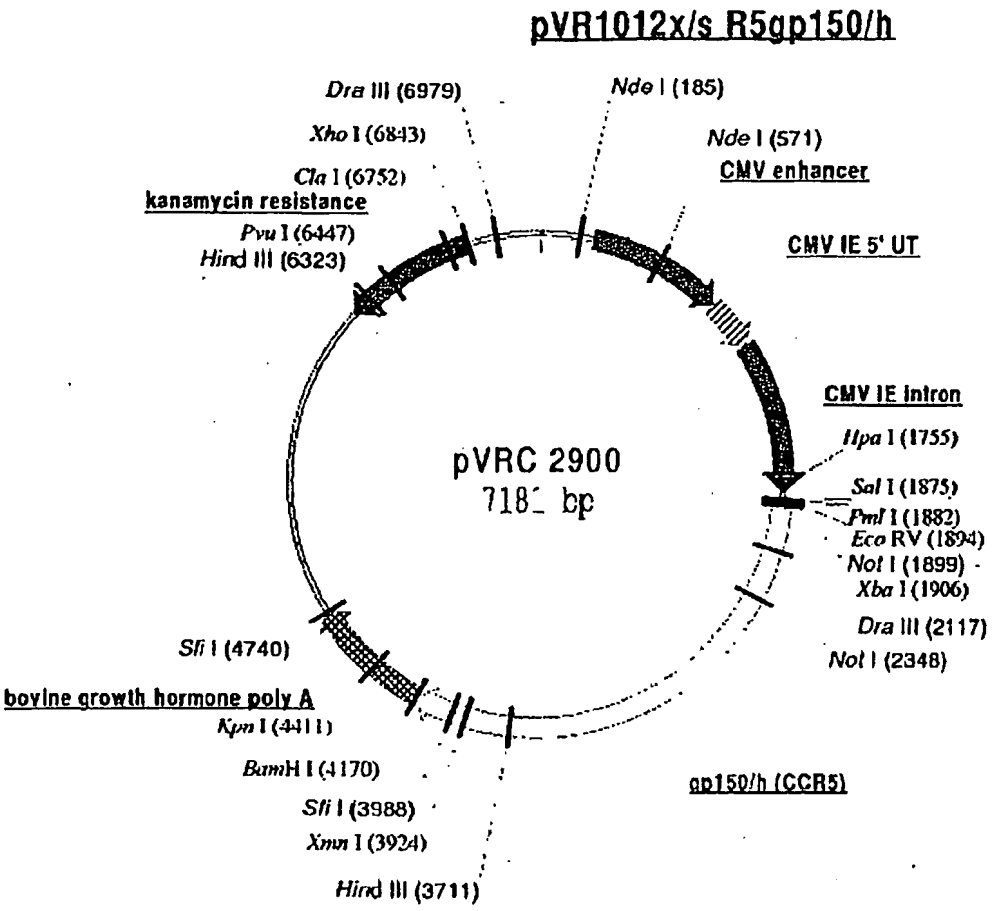

pVR1012x/s R5gp150/h
Dra III (6979)
Xho I (6843)
Cla I (6752)
kanamycin resistance
Pvu I (6447)
Hind III (6323)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UT
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2117)
Not I (2348)
pVRC 2900
718_ bp
Sfi I (4740)
bovine growth hormone poly A
Kpn I (4411)
BamH I (4170)
Sfi I (3988)
Xmn I (3924)
Hind III (3711)
gp150/h (CCR5)

Figure 70

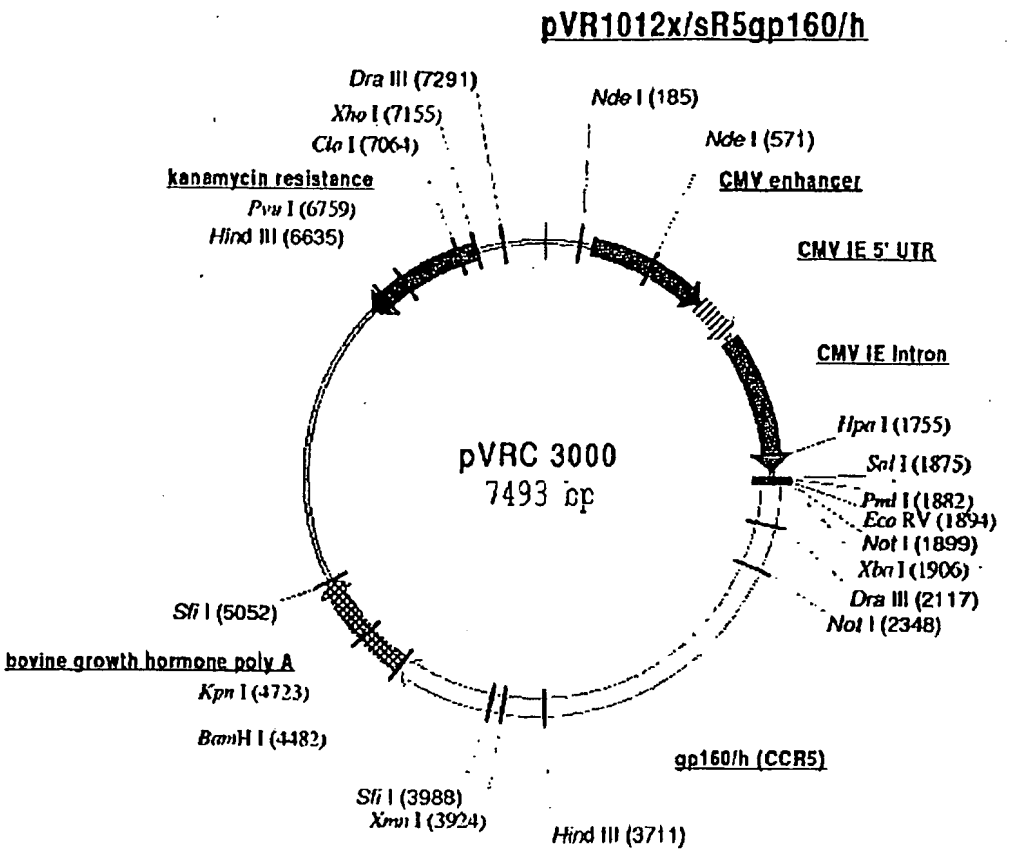

pVR1012x/sR5gp160/h
Dra III (7291)
Xho I (7155)
Cla I (7064)
kanamycin resistance
Pvu I (6759)
Hind III (6635)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2117)
Not I (2348)
pVRC 3000
7493 bp
Sfi I (5052)
bovine growth hormone poly A
Kpn I (4723)
BamH I (4482)
Sfi I (3988)
Xmn I (3924)
Hind III (3711)
gp160/h (CCR5)

Figure 71

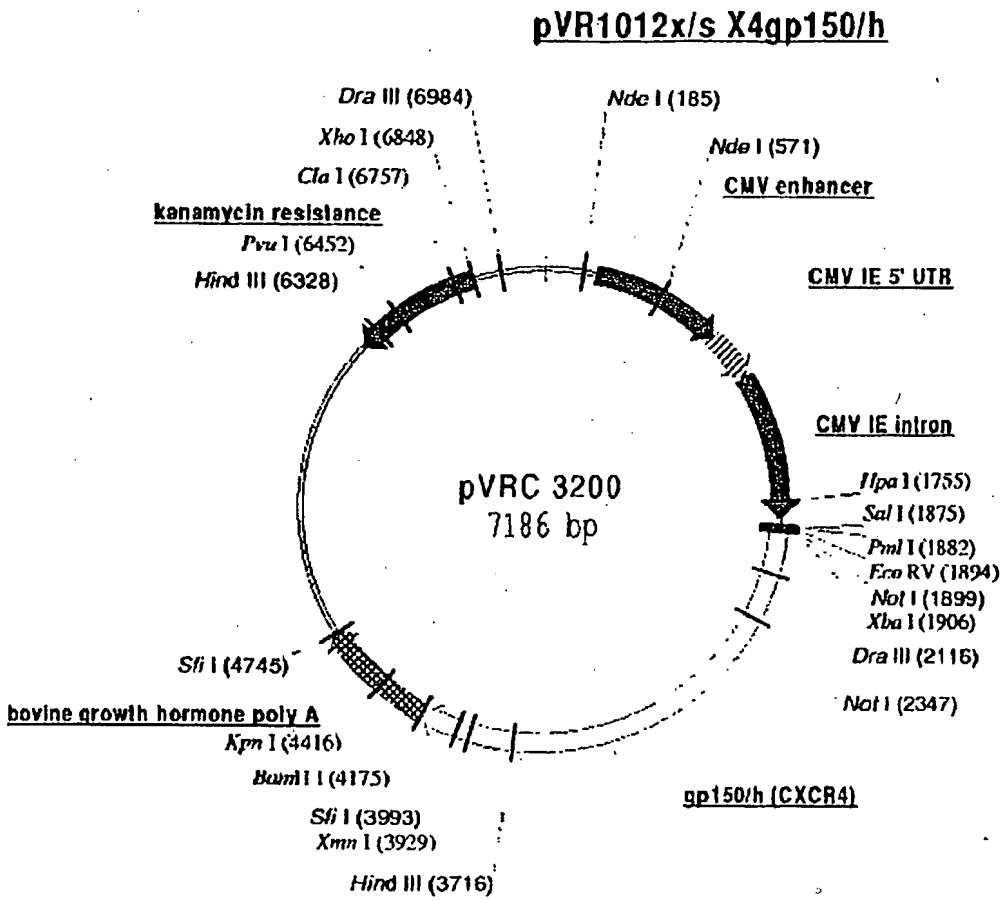

pVR1012x/s X4gp150/h
Dra III (6984)
Xho I (6848)
Cla I (6757)
kanamycin resistance
Pvu I (6452)
Hind III (6328)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
pVRC 3200
7186 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sfi I (4745)
bovine growth hormone poly A
Kpn I (4416)
BamH I (4175)
Sfi I (3993)
Xmn I (3929)
Hind III (3716)
gp150/h (CXCR4)

Figure 72

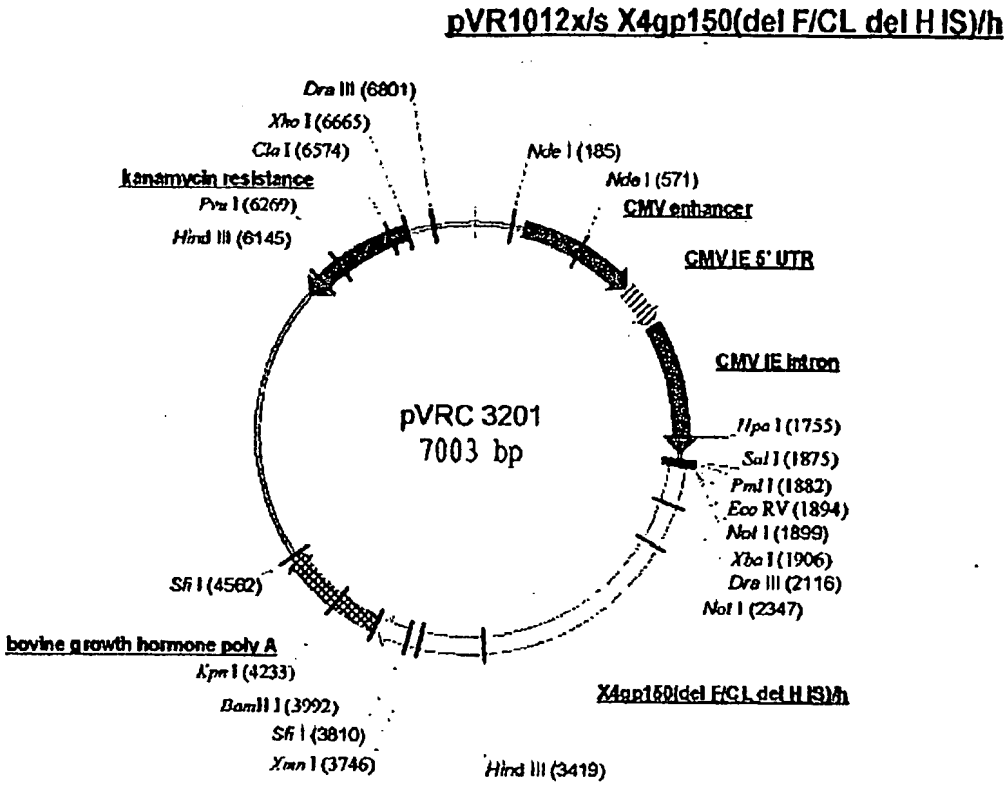

pVR1012x/s X4gp150(del F/CL del H IS)/h
Dra III (6801)
Xho I (6665)
Cla I (6574)
kanamycin resistance
Pvu I (6269)
Hind III (6145)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
pVRC 3201
7003 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sfi I (4562)
bovine growth hormone poly A
Kpn I (4233)
BamH I (3992)
Sfi I (3810)
Xmn I (3746)
Hind III (3419)
X4gp150(del F/CL del H IS)/h

Figure 73

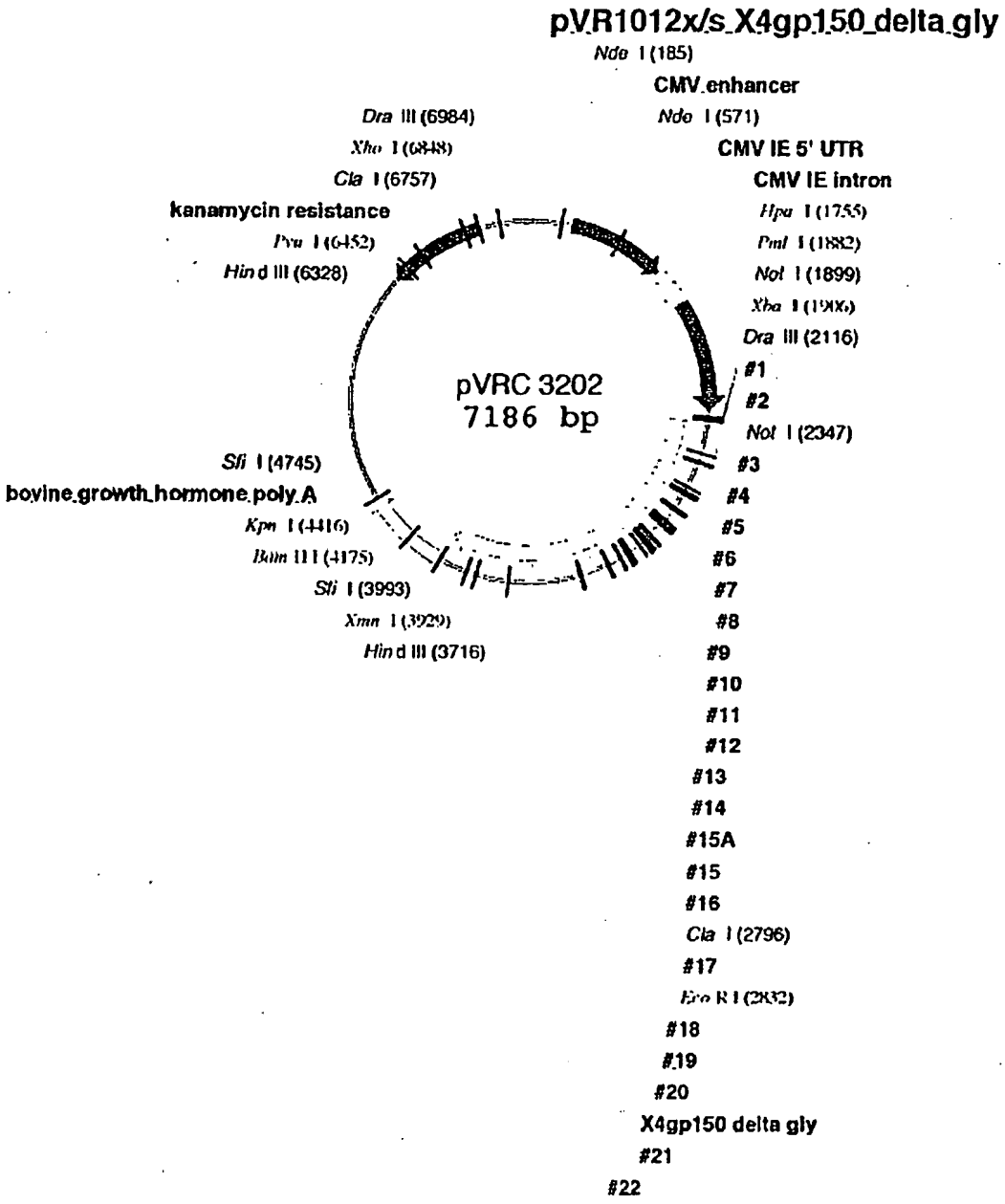

pVR1012x/s_X4gp150_delta.gly
Nde I (185)
CMV enhancer
Nde I (571)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Pml I (1882)
Not I (1899)
Xba I (1906)
Dra III (2116)
#1
#2
Not I (2347)
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
#15A
#15
#16
Cla I (2796)
#17
Eco R I (2832)
#18
#19
#20
X4gp150 delta gly
#21
#22
Dra III (6984)
Xho I (6848)
Cla I (6757)
kanamycin resistance
Pvu I (6452)
Hind III (6328)
Sfi I (4745)
bovine growth hormone poly A
Kpn I (4416)
Bam HI (4175)
Sfi I (3993)
Xmn I (3929)
Hind III (3716)
pVRC 3202
7186 bp

Figure 74

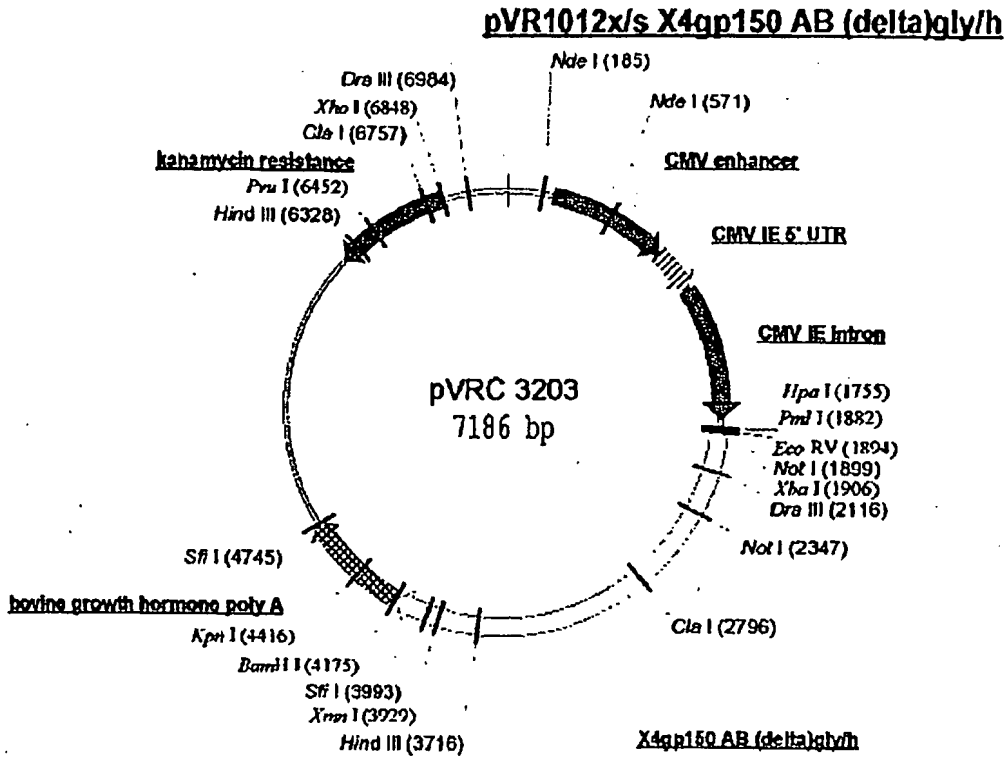

pVR1012x/s X4gp150 AB (delta)gly/h
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Cla I (2796)
X4gp150 AB (delta)gly/h
Hind III (3716)
Xmn I (3929)
Sfi I (3993)
BamH I (4175)
Kpn I (4416)
bovine growth hormone poly A
Sfi I (4745)
kanamycin resistance
Pvu I (6452)
Hind III (6328)
Cla I (6757)
Xho I (6848)
Dra III (6984)
pVRC 3203
7186 bp

Figure 75

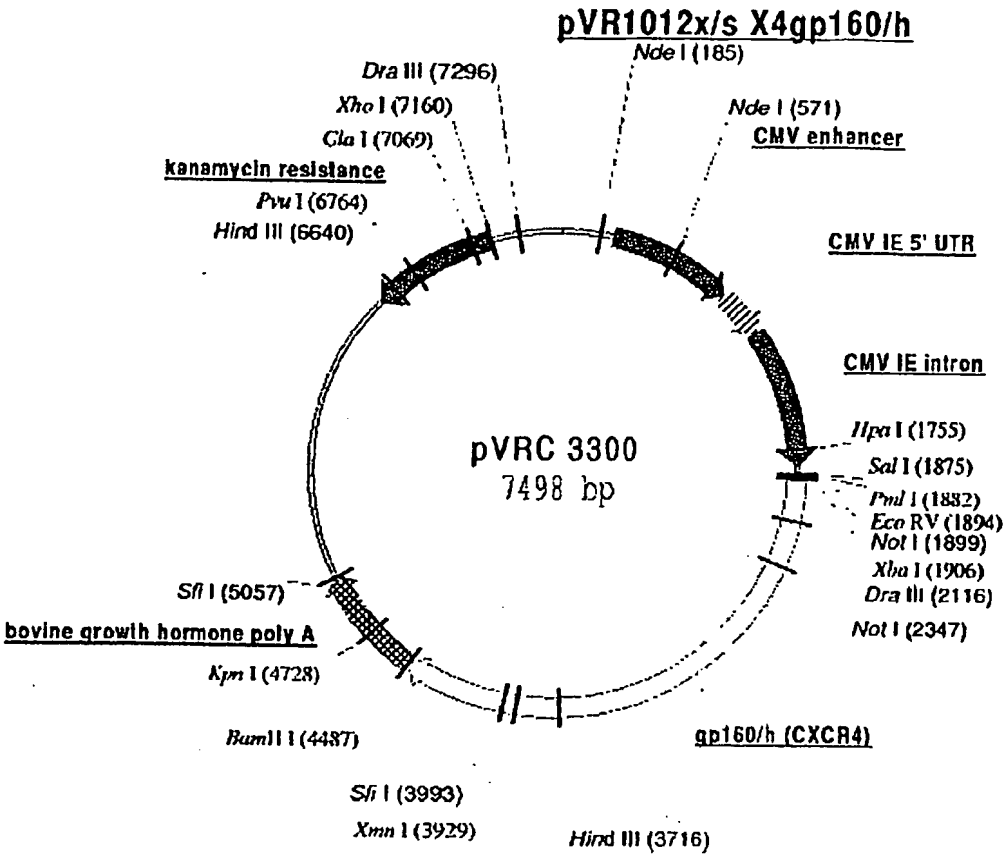

pVR1012x/s X4gp160/h
Nde I (185)
Dra III (7296)
Xho I (7160)
Cla I (7069)
kanamycin resistance
Pvu I (6764)
Hind III (6640)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
pVRC 3300
7498 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sfi I (5057)
bovine growth hormone poly A
Kpn I (4728)
BamH I (4487)
gp160/h (CXCR4)
Sfi I (3993)
Xmn I (3929)
Hind III (3716)

Figure 76

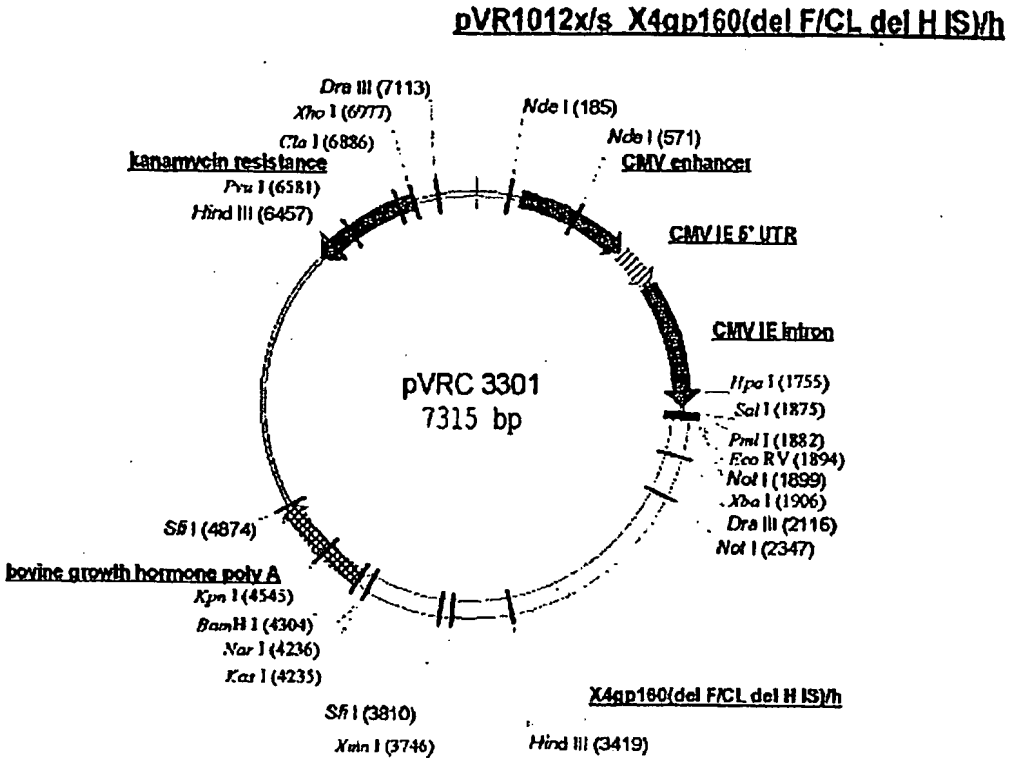

pVR1012x/s X4gp160(del F/CL del H IS)/h
Dra III (7113)
Xho I (6777)
Cla I (6886)
kanamycin resistance
Pvu I (6581)
Hind III (6457)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
pVRC 3301
7315 bp
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
Sfi I (4874)
bovine growth hormone poly A
Kpn I (4545)
BamH I (4304)
Nar I (4236)
Kas I (4235)
Sfi I (3810)
Xmn I (3746)
X4gp160(del F/CL del H IS)/h
Hind III (3419)

Figure 77

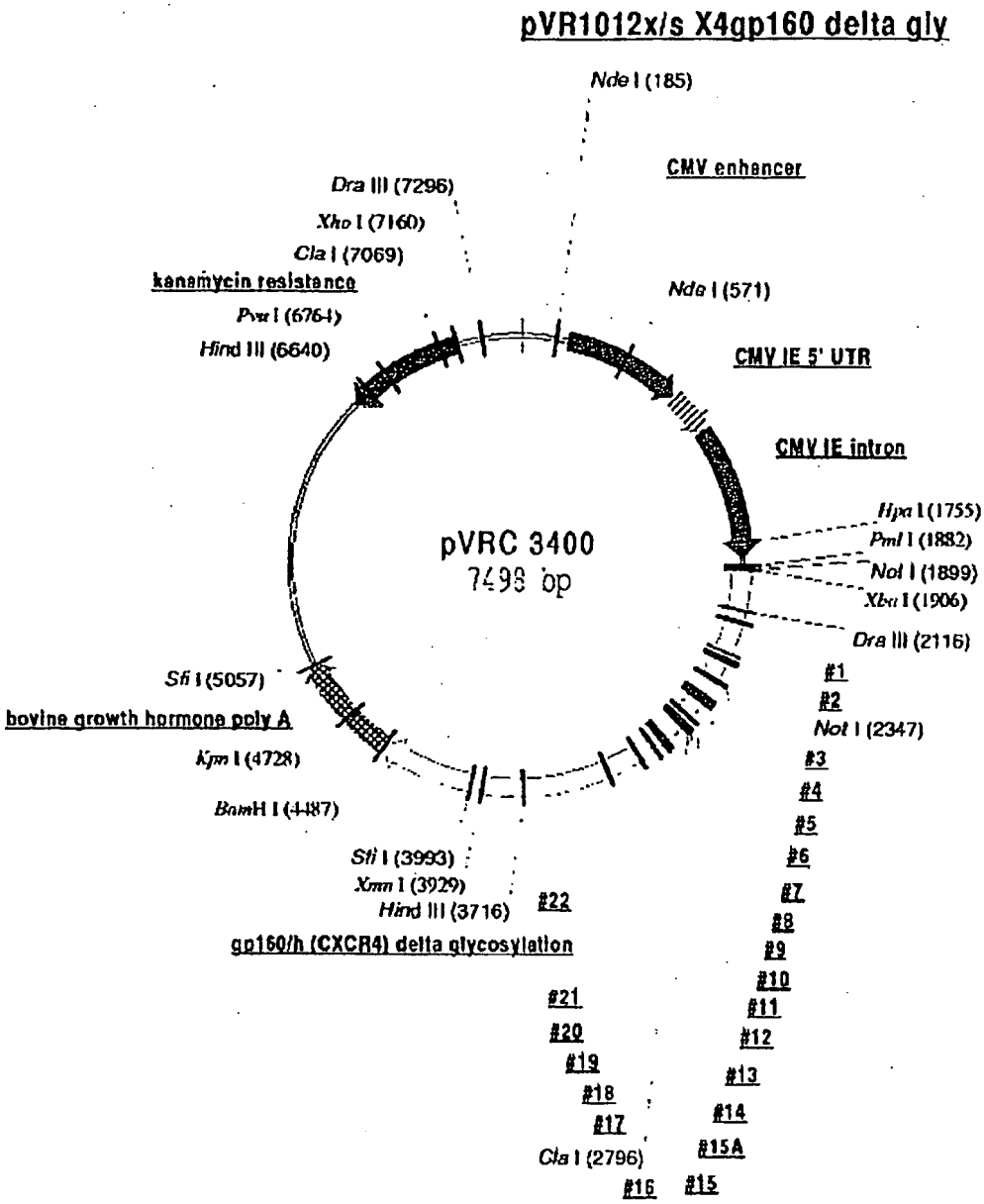

pVR1012x/s X4gp160 delta gly
Nde I (185)
CMV enhancer
Dra III (7296)
Xho I (7160)
Cla I (7069)
kanamycin resistance
Pvu I (6764)
Hind III (6640)
Nde I (571)
CMV IE 5' UTR
CMV IE intron
pVRC 3400
7498 bp
Hpa I (1755)
Pml I (1882)
Not I (1899)
Xba I (1906)
Dra III (2116)
#1
#2
Not I (2347)
#3
#4
#5
#6
#7
#8
#9
#10
#11
#12
#13
#14
#15A
#15
Sfi I (5057)
bovine growth hormone poly A
Kpn I (4728)
BamH I (4487)
Sfi I (3993)
Xmn I (3929)
Hind III (3716)
#22
gp160/h (CXCR4) delta glycosylation
#21
#20
#19
#18
#17
Cla I (2796)
#16

Figure 78

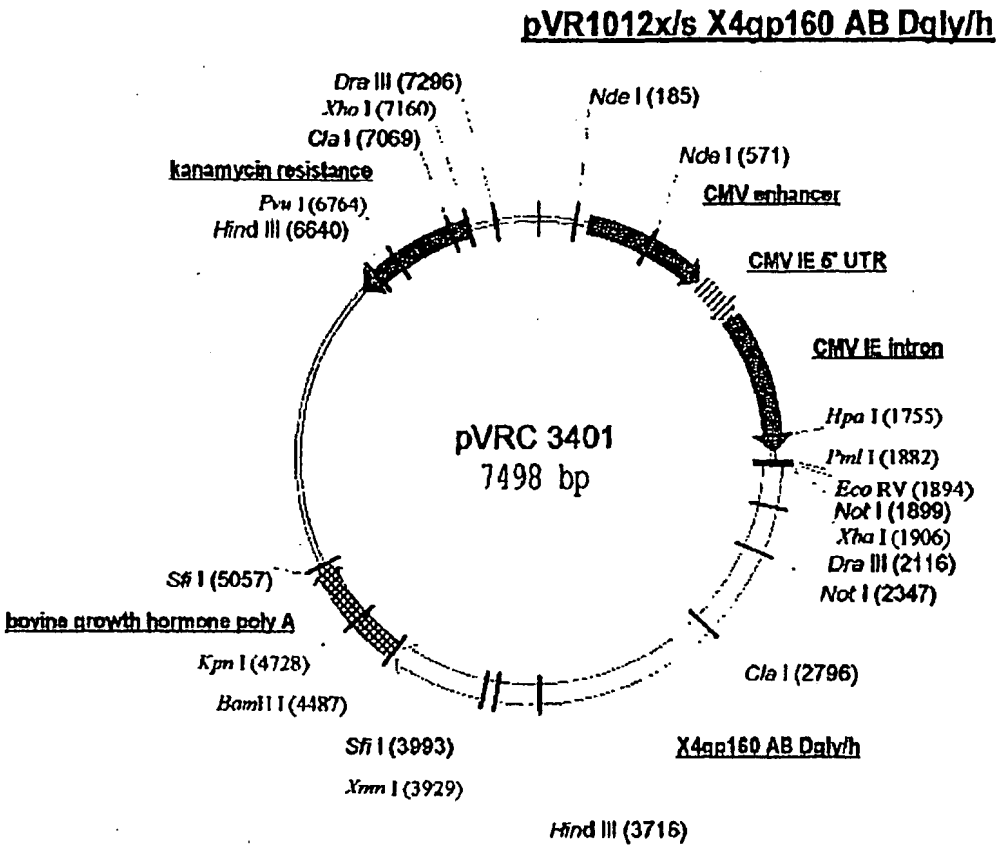

pVR1012x/s X4gp160 AB Dglyh
Dra III (7296)
Xho I (7160)
Cla I (7069)
kanamycin resistance
Pvu I (6764)
Hind III (6640)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Dra III (2116)
Not I (2347)
pVRC 3401
7498 bp
Sfi I (5057)
bovine growth hormone poly A
Kpn I (4728)
BamH I (4487)
Sfi I (3993)
Xmn I (3929)
Hind III (3716)
Cla I (2796)
X4gp160 AB Dglyh

Figure 79

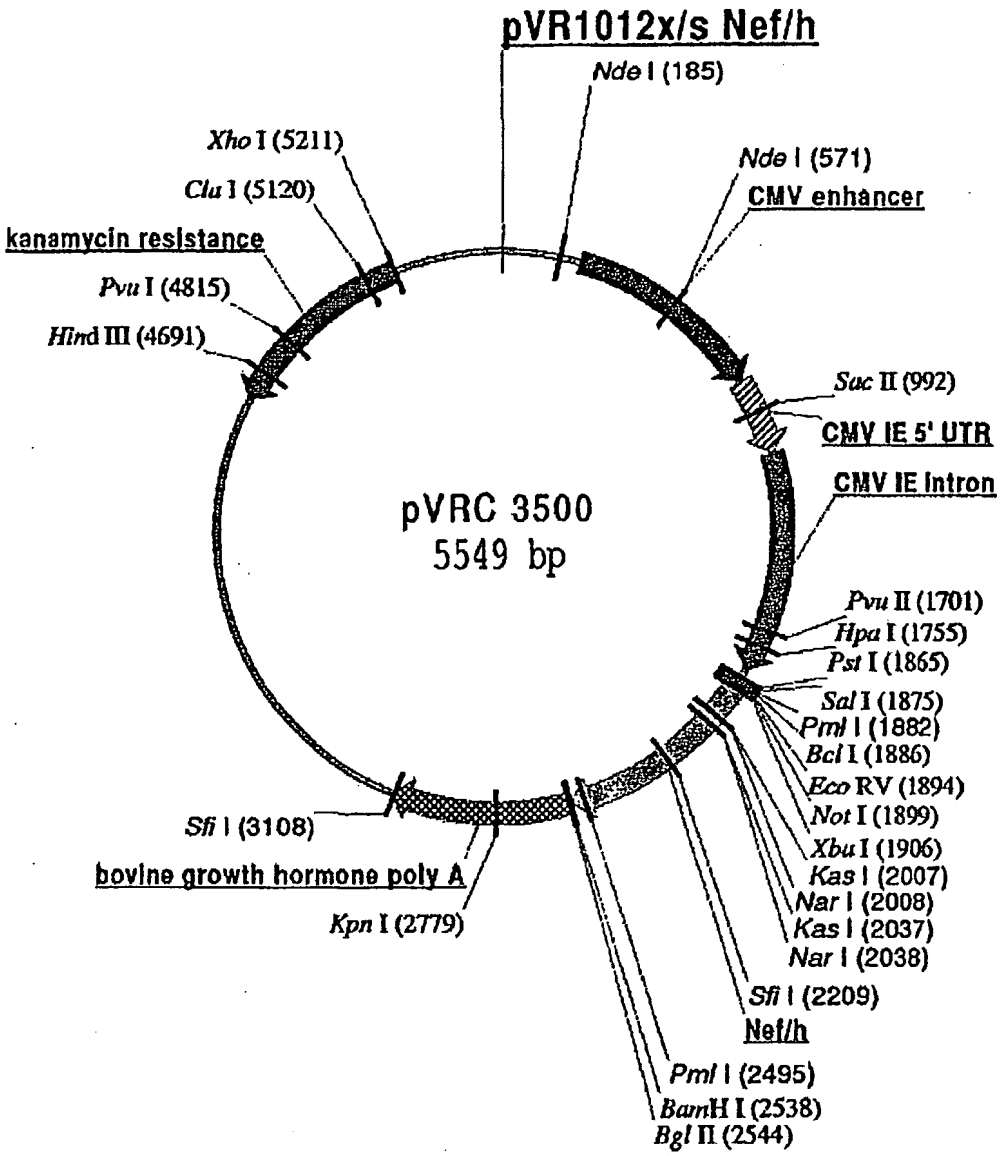

pVR1012x/s Nef/h
Nde I (185)
Nde I (571)
CMV enhancer
Xho I (5211)
Clu I (5120)
kanamycin resistance
Pvu I (4815)
Hind III (4691)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
pVRC 3500
5549 bp
Pvu II (1701)
Hpa I (1755)
Pst I (1865)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xbu I (1906)
Kas I (2007)
Nar I (2008)
Kas I (2037)
Nar I (2038)
Sfi I (3108)
bovine growth hormone poly A
Kpn I (2779)
Sfi I (2209)
Nef/h
Pml I (2495)
BamH I (2538)
Bgl II (2544)

Figure 80

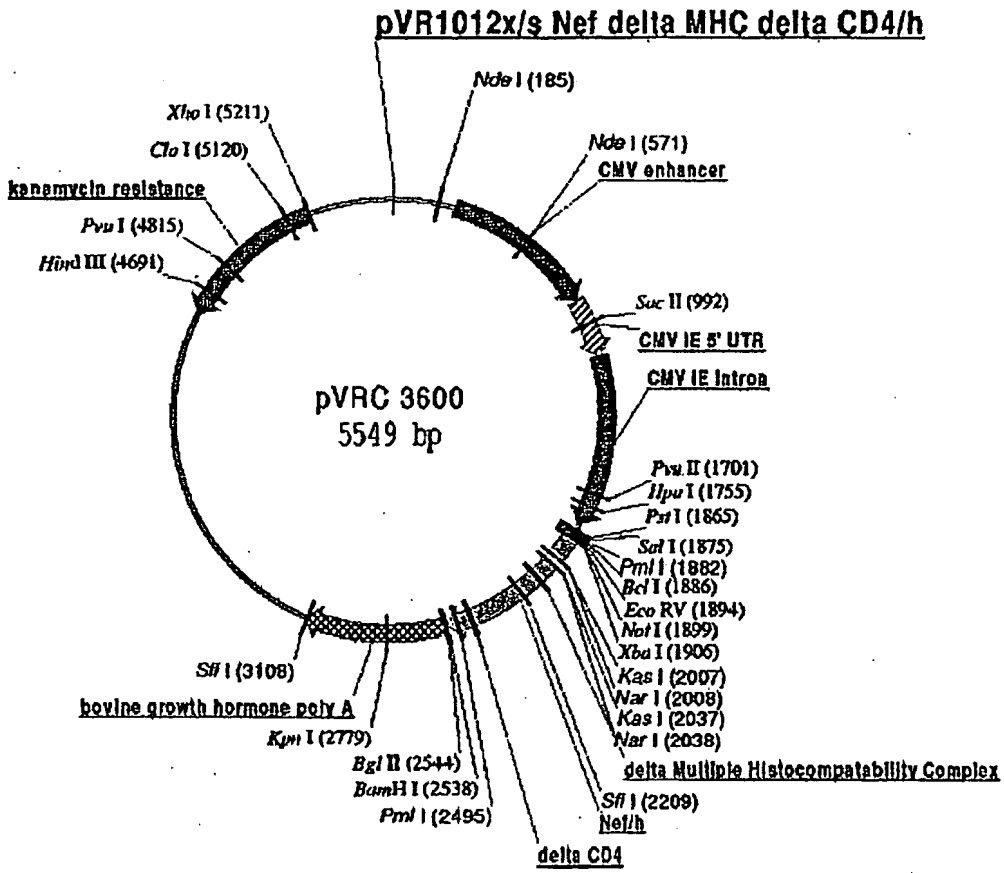

pVR1012x/s Nef delta MHC delta CD4/h
pVRC 3600
5549 bp
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Pvu II (1701)
Hpa I (1755)
Pst I (1865)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Kas I (2007)
Nar I (2008)
Kas I (2037)
Nar I (2038)
delta Multiple Histocompatability Complex
Sfi I (2209)
Nef/h
delta CD4
Pml I (2495)
BamH I (2538)
Bgl II (2544)
Kpn I (2779)
bovine growth hormone poly A
Sfi I (3108)
kanamycin resistance
Pvu I (4815)
Hind III (4691)
Cla I (5120)
Xho I (5211)

Figure 81

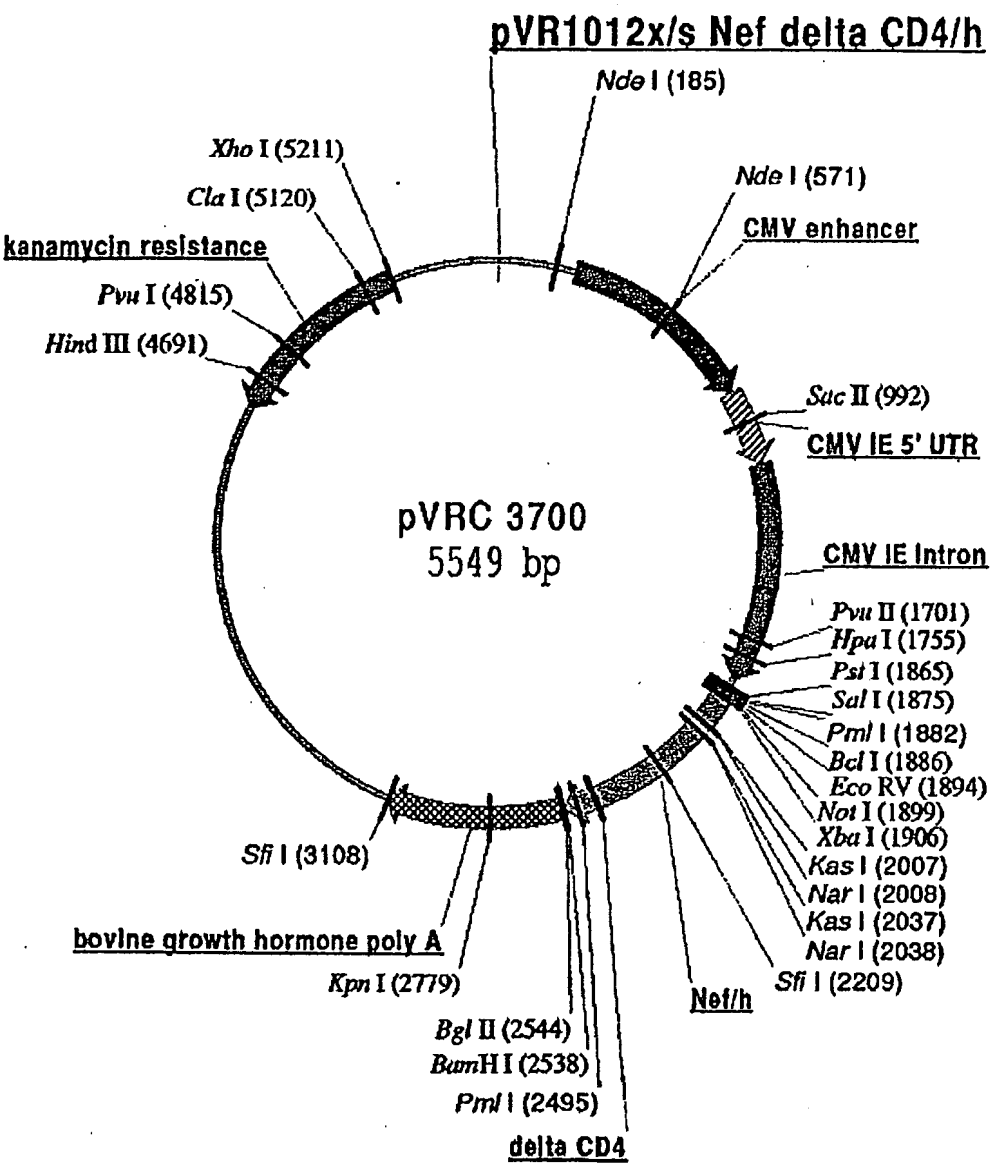

pVR1012x/s Nef delta CD4/h
Nde I (185)
Nde I (571)
CMV enhancer
Suc II (992)
CMV IE 5' UTR
CMV IE Intron
Pvu II (1701)
Hpa I (1755)
Pst I (1865)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Kas I (2007)
Nar I (2008)
Kas I (2037)
Nar I (2038)
Sfi I (2209)
Nef/h
Bgl II (2544)
BamH I (2538)
Pml I (2495)
delta CD4
Kpn I (2779)
bovine growth hormone poly A
Sfi I (3108)
kanamycin resistance
Pvu I (4815)
Hind III (4691)
Cla I (5120)
Xho I (5211)
pVRC 3700
5549 bp

Figure 82

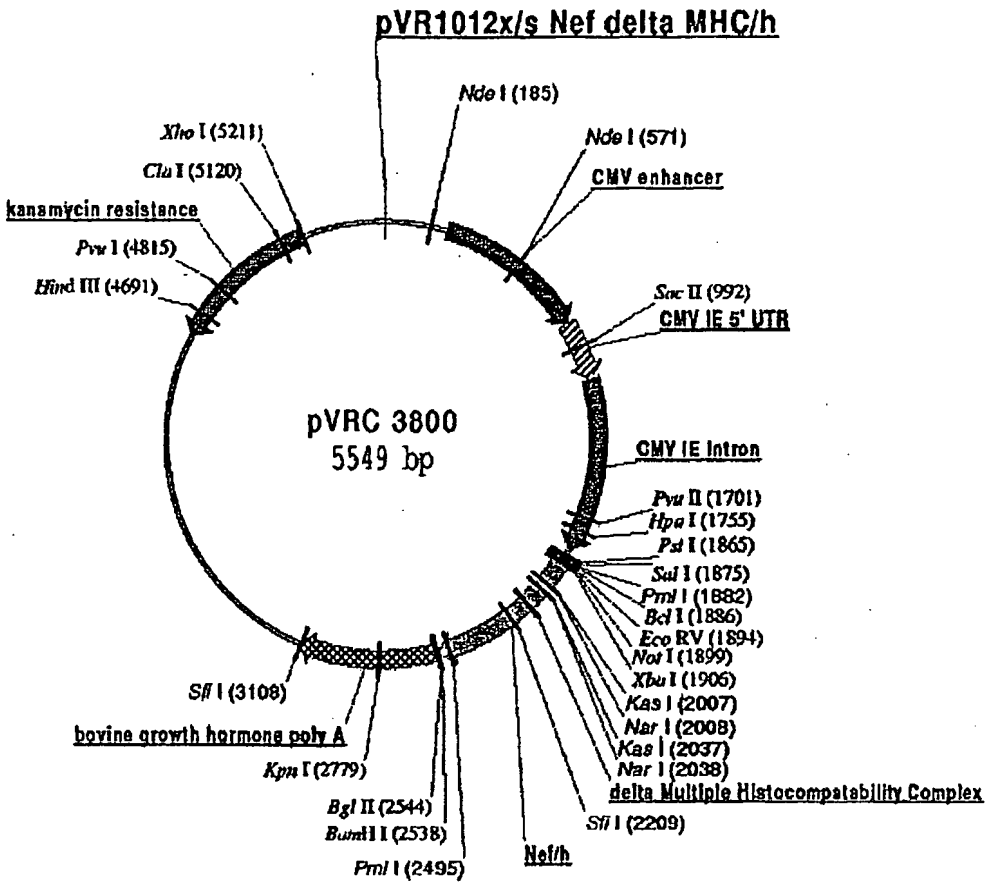

pVR1012x/s Nef delta MHC/h
pVRC 3800
5549 bp
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Pvu II (1701)
Hpa I (1755)
Pst I (1865)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Kas I (2007)
Nar I (2008)
Kas I (2037)
Nar I (2038)
delta Multiple Histocompatability Complex
Sfi I (2209)
Nef/h
Pml I (2495)
BamH I (2538)
Bgl II (2544)
Kpn I (2779)
bovine growth hormone poly A
Sfi I (3108)
Hind III (4691)
Pvu I (4815)
kanamycin resistance
Cla I (5120)
Xho I (5211)

Figure 83

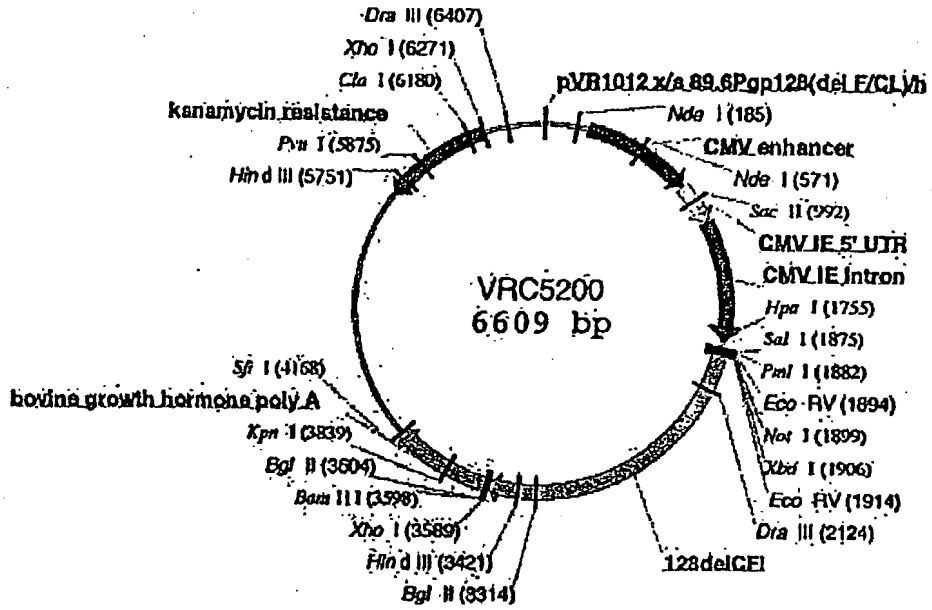

Dra III (6407)
Xho I (6271)
Cla I (6180)
kanamycin resistance
Pvu I (5875)
Hind III (5751)
pVR1012 x/a 89.6Pgp128(delE/CL)/b
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xbal I (1906)
Eco RV (1914)
Dra III (2124)
128delCEI
VRC5200
6609 bp
Sfi I (4168)
bovine growth hormone poly A
Kpn I (3839)
Bgl II (3604)
Bam III (3598)
Xho I (3589)
Hind III (3421)
Bgl II (3314)

Figure 84

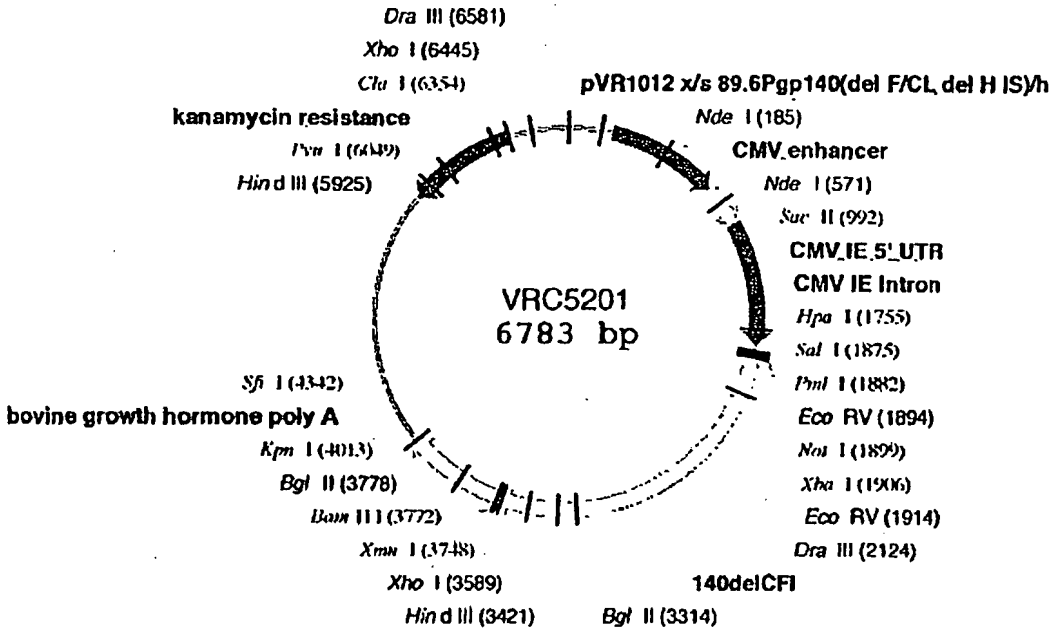

Dra III (6581)
Xho I (6445)
Cla I (6354)
kanamycin resistance
Pvu I (6349)
Hind III (5925)
pVR1012 x/s 89.6Pgp140(del F/CL del H IS)/h
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2124)
140delCFI
Bgl II (3314)
VRC5201
6783 bp
Sfi I (4342)
bovine growth hormone poly A
Kpn I (4013)
Bgl II (3778)
Bam HI (3772)
Xmn I (3748)
Xho I (3589)
Hind III (3421)

Figure 85

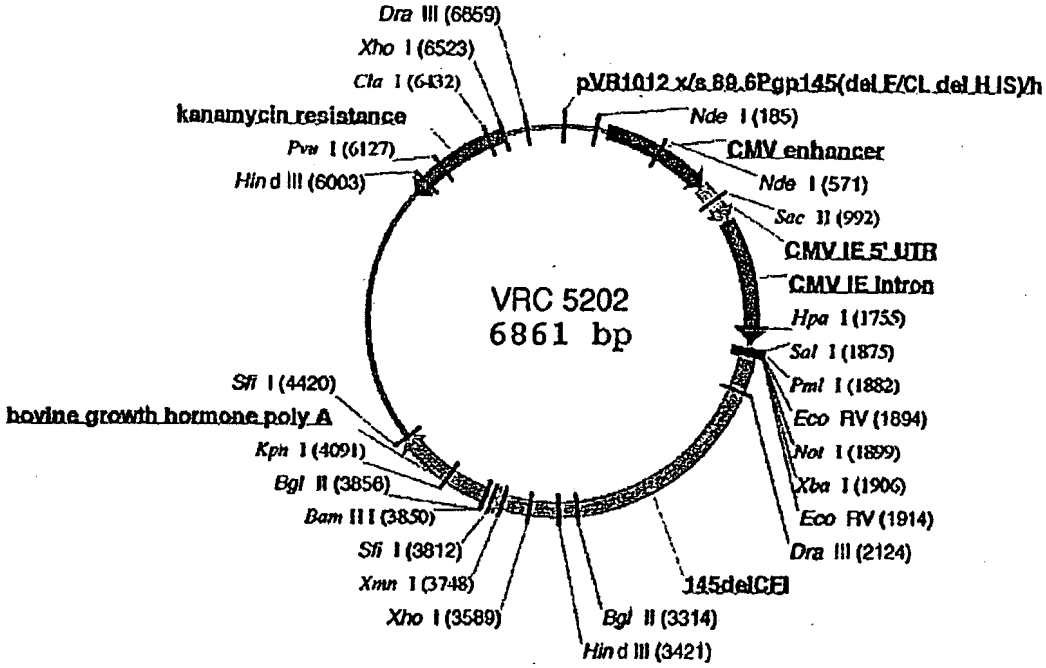

Dra III (6859)
Xho I (6523)
Cla I (6432)
kanamycin resistance
Pvu I (6127)
Hind III (6003)
pVR1012 x/s 89.6Pgp145(delF/Cl delH1S)/h
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2124)
145delCFI
Bgl II (3314)
Hind III (3421)
Xho I (3589)
Xmn I (3748)
Sfi I (3812)
Bam HI (3850)
Bgl II (3856)
Kpn I (4091)
bovine growth hormone poly A
Sfi I (4420)
VRC 5202
6861 bp

Figure 86

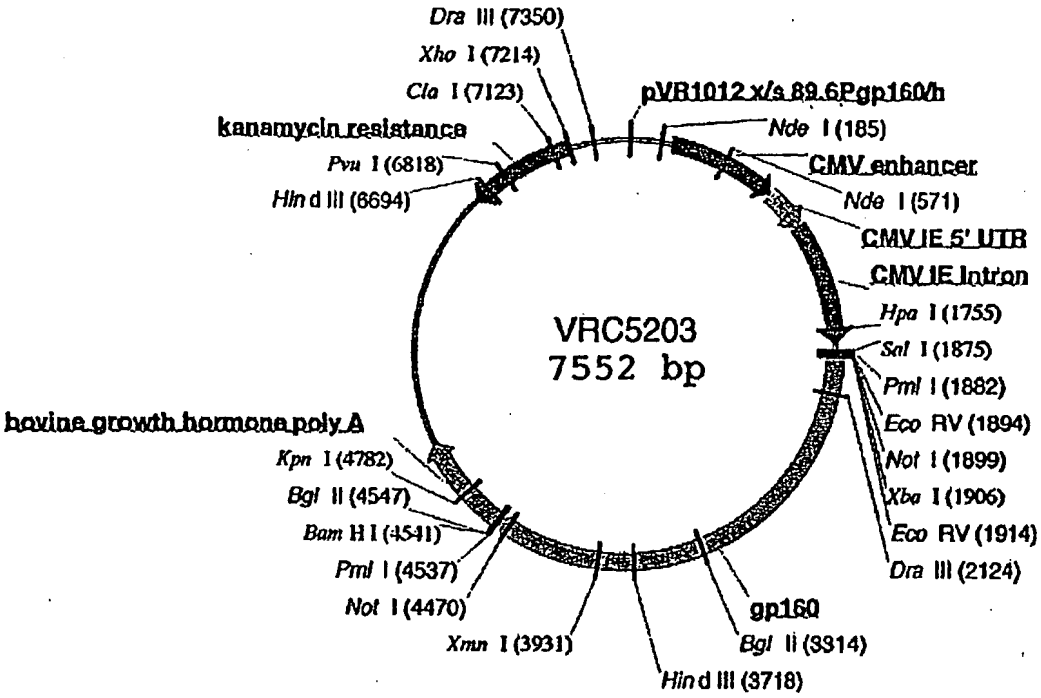

Dra III (7350)
Xho I (7214)
Cla I (7123)
kanamycin resistance
Pvu I (6818)
Hind III (6694)
pVR1012 x/s 89.6Pgp160h
Nde I (185)
CMV enhancer
Nde I (571)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2124)
VRC5203
7552 bp
bovine growth hormone poly A
Kpn I (4782)
Bgl II (4547)
Bam H I (4541)
Pml I (4537)
Not I (4470)
Xmn I (3931)
gp160
Bgl II (3314)
Hind III (3718)

Figure 87

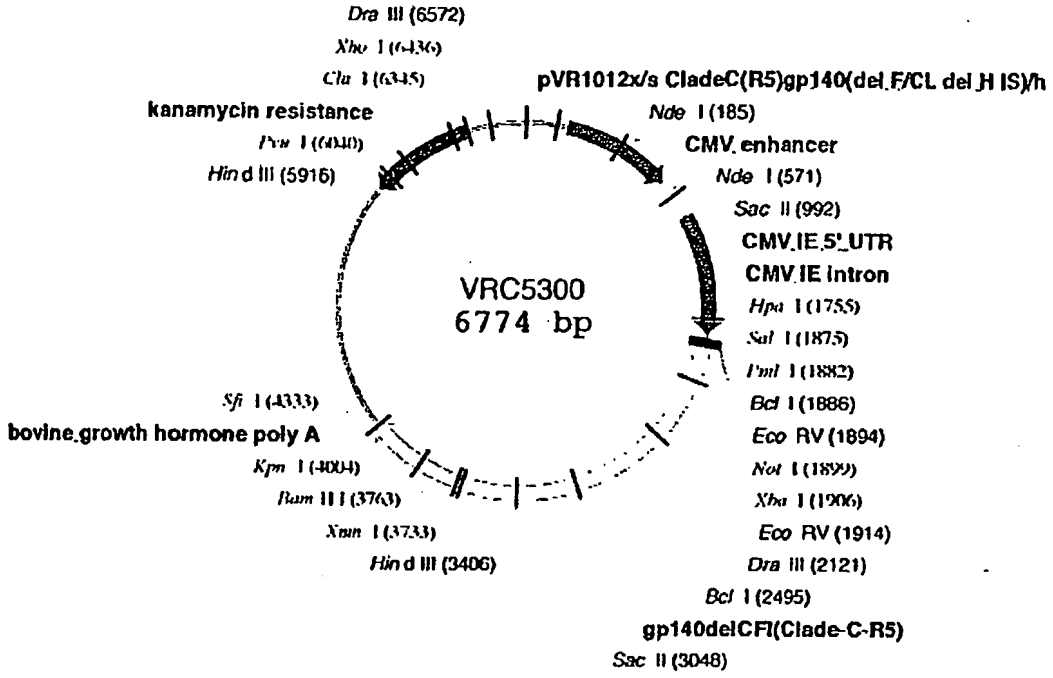

Dra III (6572)
Xho I (6436)
Cla I (6345)
kanamycin resistance
Pvu I (6330)
Hind III (5916)
pVR1012x/s CladeC(R5)gp140(del.F/CL del.H IS)/h
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV.IE.5'.UTR
CMV.IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
gp140delCFI(Clade-C-R5)
Sac II (3048)
VRC5300
6774 bp
Sfi I (4333)
bovine.growth hormone poly A
Kpn I (4004)
Bam III (3763)
Xmn I (3733)
Hind III (3406)

Figure 88

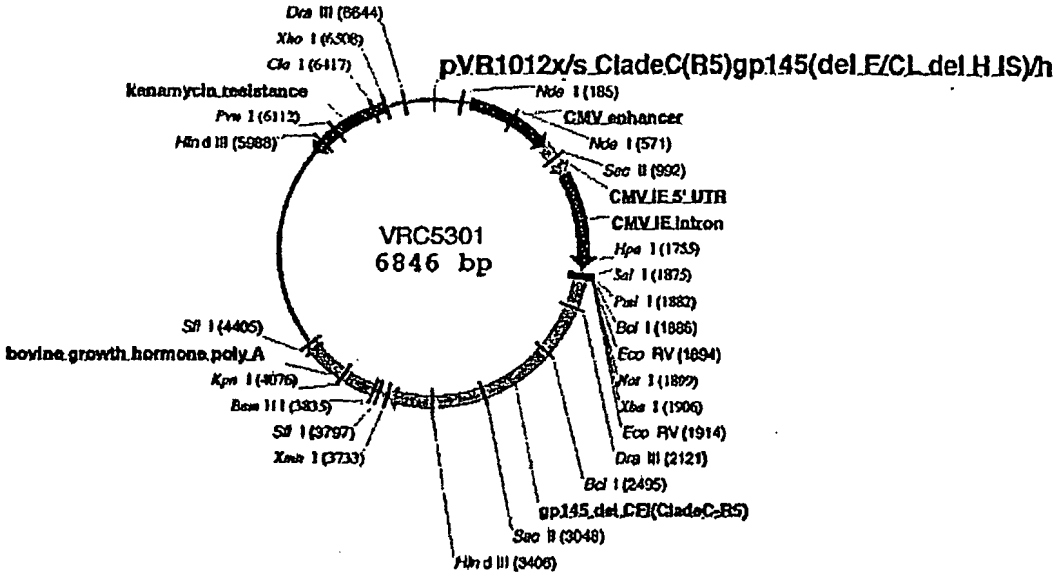

pVR1012x/s_CladeC(R5)gp145(del.E/C)_del.H.IS)/h
VRC5301
6846 bp
Dra III (6644)
Xho I (6508)
Cla I (6417)
kanamycin resistance
Pvu I (6112)
Hind III (5988)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1739)
Sal I (1875)
Pst I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1897)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
gp145_del.CFI(CladeC_R5)
Sac II (3048)
Hind III (3406)
Sfi I (3797)
Xmn I (3733)
Sfi I (4405)
bovine growth hormone poly A

Figure 89

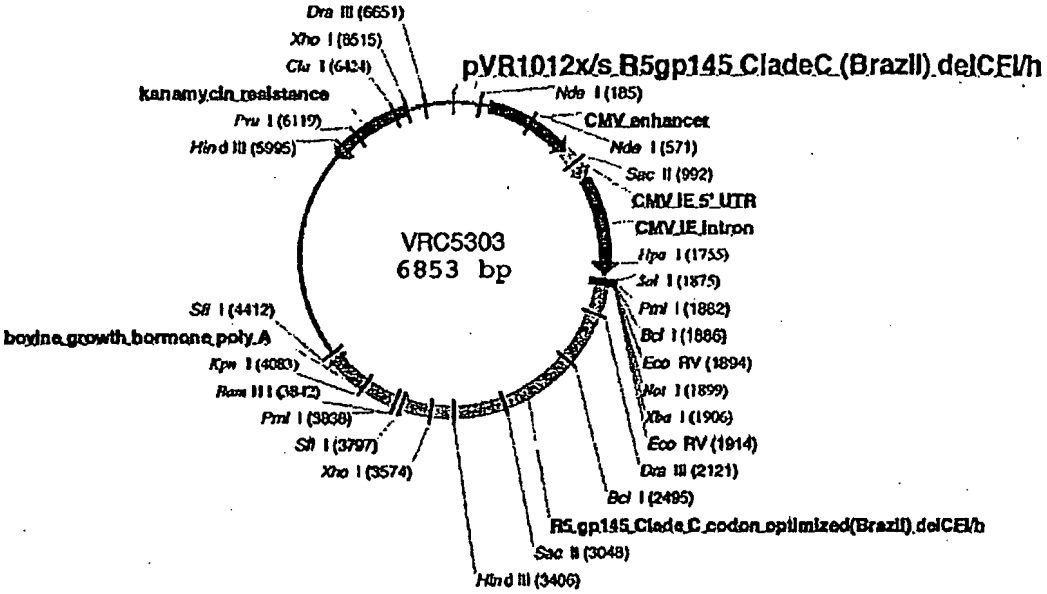

pVR1012x/s R5gp145 CladeC (Brazil) delCFI/h
VRC5303
6853 bp
Dra III (6651)
Xho I (6515)
Cla I (6424)
kanamycin resistance
Pvu I (6119)
Hind III (5995)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
R5 gp145 Clade C codon optimized (Brazil) delCFI/h
Sac II (3048)
Hind III (3406)
Xho I (3574)
Sfi I (3797)
Pml I (3838)
BamH I (3872)
Kpn I (4083)
boyine growth hormone poly A
Sfi I (4412)

Figure 90

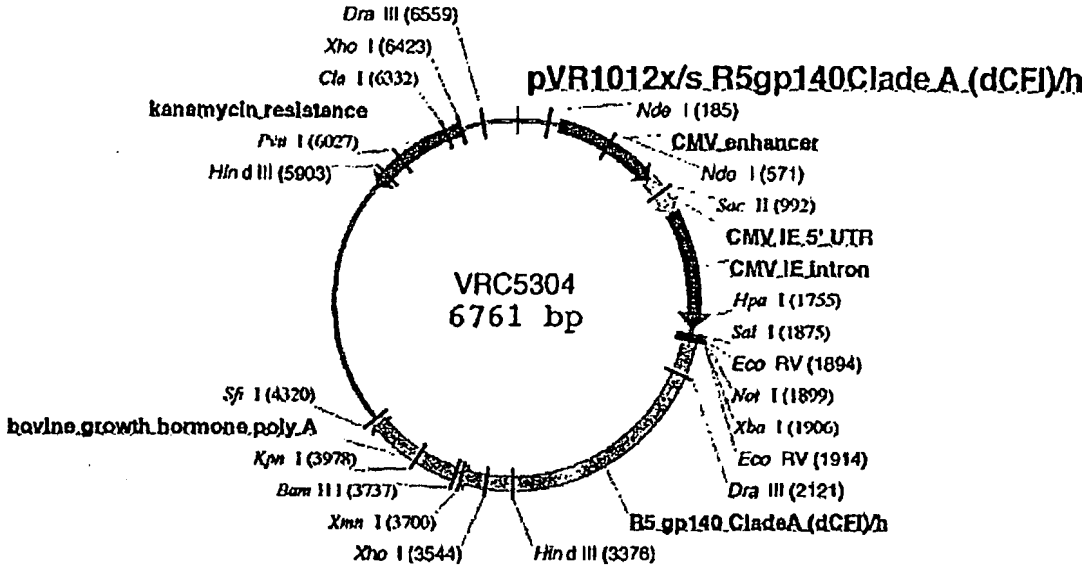

pVR1012x/s_R5gp140Clade_A_(dCFI)/h
VRC5304
6761 bp
Dra III (6559)
Xho I (6423)
Cla I (6332)
kanamycin resistance
Pvu I (6027)
Hind III (5903)
Nde I (185)
CMV_enhancer
Nde I (571)
Sac II (992)
CMV_IE_5'_UTR
CMV_IE_intron
Hpa I (1755)
Sal I (1875)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
R5_gp140_CladeA_(dCFI)/h
Hind III (3378)
Xho I (3544)
Xmn I (3700)
Bam HI (3737)
Kpn I (3978)
bovine_growth_hormone_poly_A
Sfi I (4320)

Figure 91

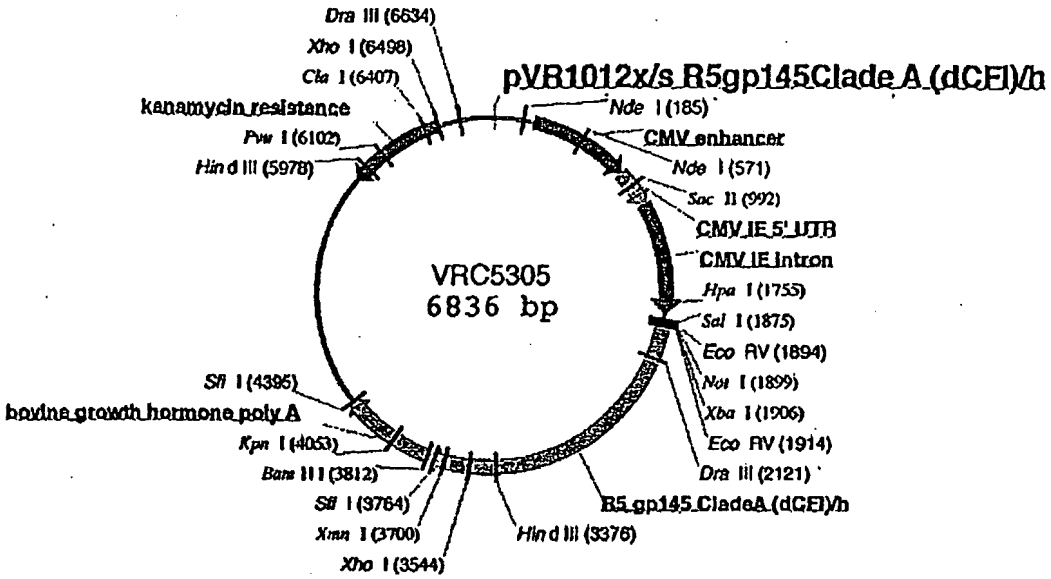

pVR1012x/s R5gp145Clade A (dCFI)/h
VRC5305
6836 bp
Dra III (6634)
Xho I (6498)
Cla I (6407)
kanamycin resistance
Pvu I (6102)
Hind III (5978)
Nde I (185)
CMV enhancer
Nde I (571)
Soc II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
R5 gp145 CladeA (dCFI)/h
Hind III (3376)
Xho I (3544)
Xmn I (3700)
Sfi I (3764)
Bam HI (3812)
Kpn I (4053)
bovine growth hormone poly A
Sfi I (4395)

Figure 92

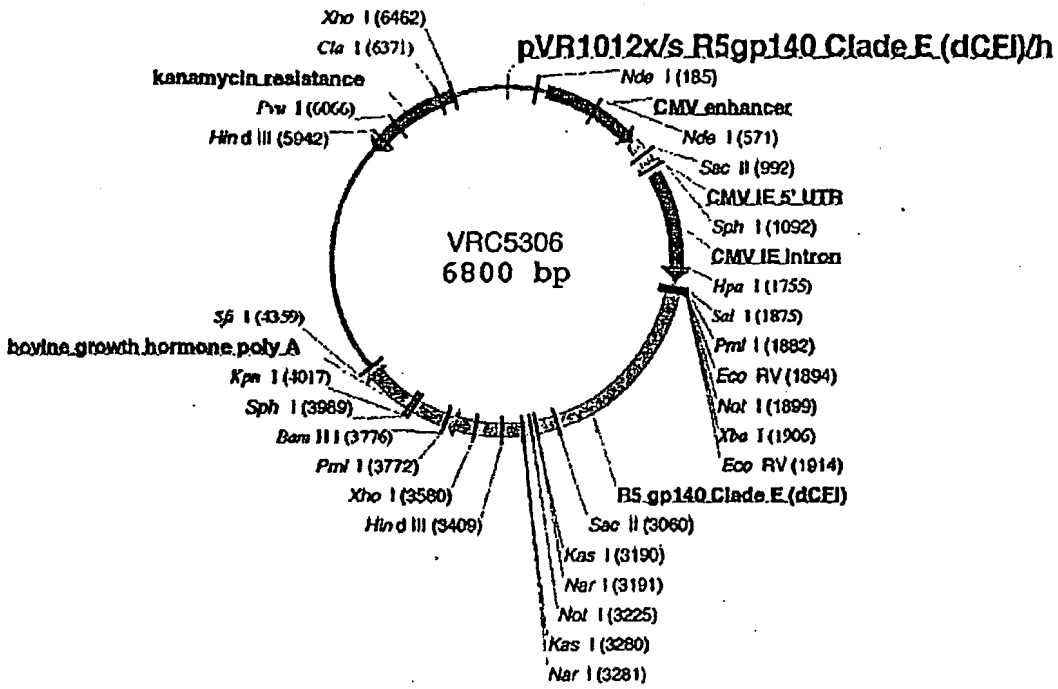

pVR1012x/s R5gp140 Clade E (dCFI)/h
VRC5306
6800 bp
Xho I (6462)
Cla I (6371)
kanamycin resistance
Pvu I (6066)
Hind III (5942)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
R5 gp140 Clade E (dCFI)
Sac II (3060)
Kas I (3190)
Nar I (3191)
Not I (3225)
Kas I (3280)
Nar I (3281)
Hind III (3409)
Xho I (3580)
Pml I (3772)
Bam HI (3776)
Sph I (3989)
Kpn I (4017)
bovine growth hormone poly A
Sfi I (4359)

Figure 93

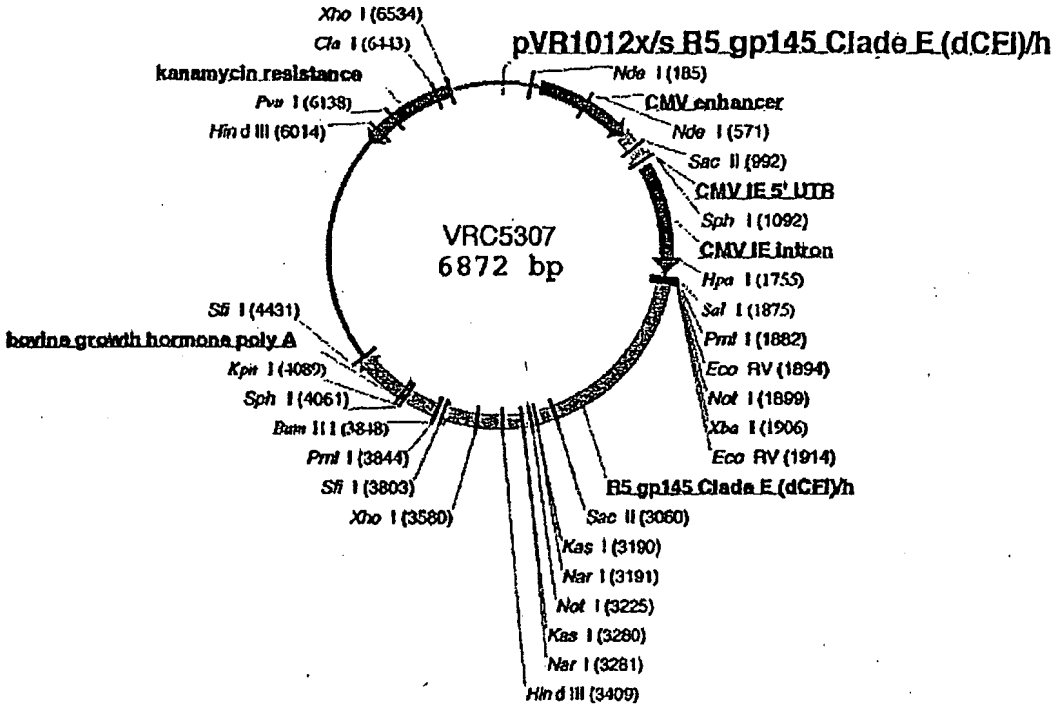

pVR1012x/s B5 gp145 Clade E (dCFI)/h
VRC5307
6872 bp
Xho I (6534)
Cla I (6443)
kanamycin resistance
Pvu I (6138)
Hind III (6014)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
B5 gp145 Clade E (dCFI)/h
Sac II (3060)
Kas I (3190)
Nar I (3191)
Not I (3225)
Kas I (3280)
Nar I (3281)
Hind III (3409)
Xho I (3580)
Sfi I (3803)
Pml I (3844)
Bam HI (3848)
Sph I (4061)
Kpn I (4089)
bovine growth hormone poly A
Sfi I (4431)

Figure 94

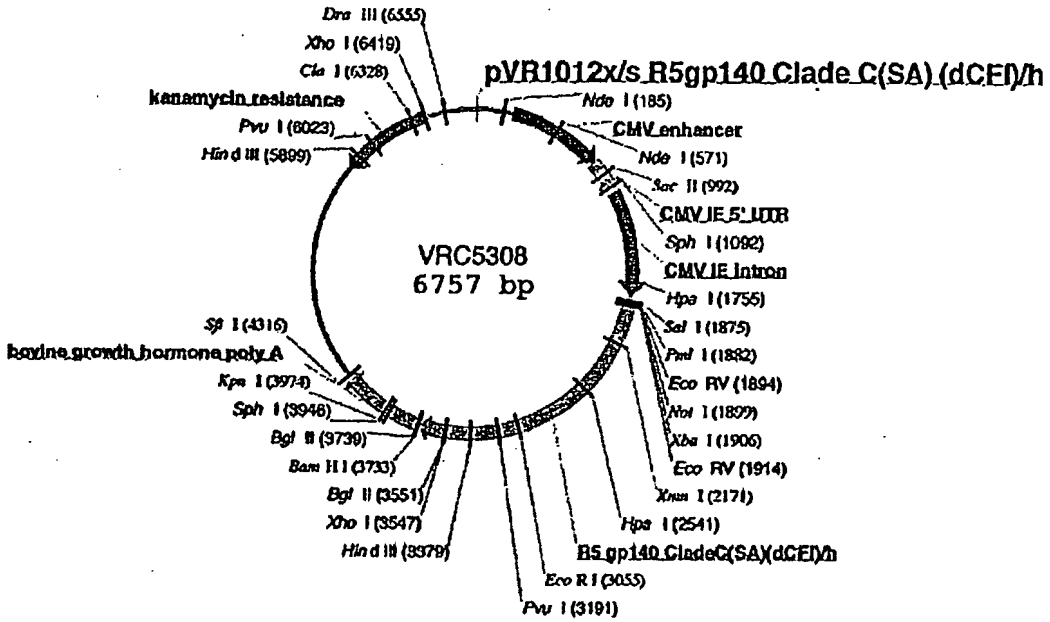

pVR1012x/s R5gp140 Clade C(SA) (dCFI)/h
VRC5308
6757 bp
Dra III (6555)
Xho I (6419)
Cla I (6328)
kanamycin resistance
Pvu I (6023)
Hind III (5899)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2541)
R5 gp140 CladeC(SA)(dCFI)/h
Eco R I (3055)
Pvu I (3191)
Hind III (3379)
Xho I (3547)
Bgl II (3551)
Bam H I (3733)
Bgl II (3739)
Sph I (3948)
Kpn I (3974)
bovine growth hormone poly A
Sfi I (4316)

Figure 95

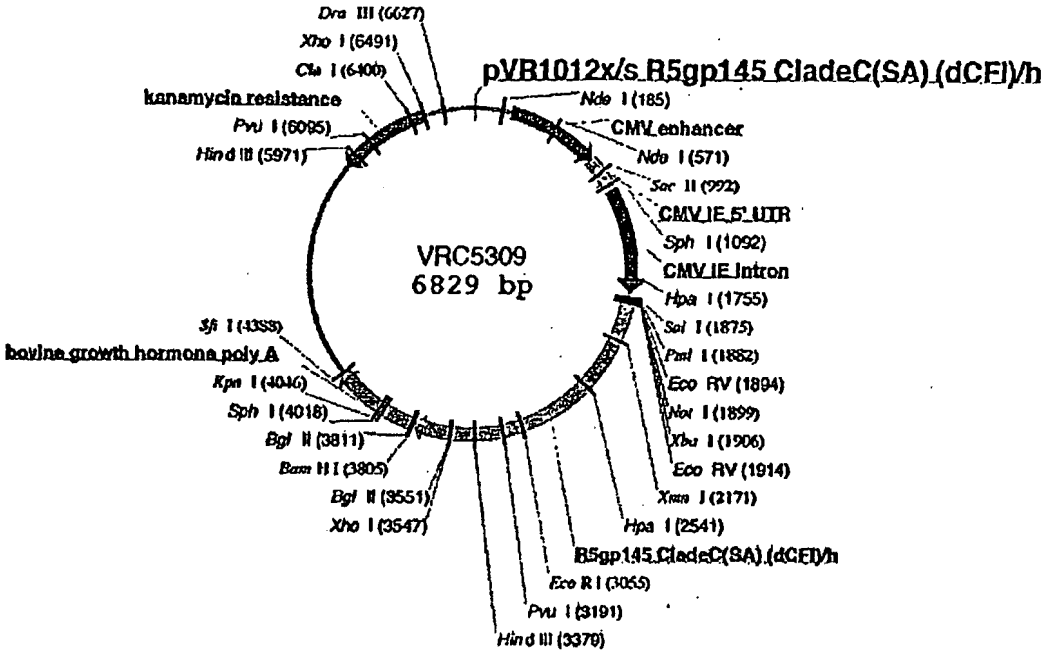

pVR1012x/s R5gp145 CladeC(SA) (dCFI)/h
VRC5309
6829 bp
Dra III (6627)
Xho I (6491)
Cla I (6400)
kanamycin resistance
Pvu I (6095)
Hind III (5971)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xma I (2171)
Hpa I (2541)
R5gp145 CladeC(SA) (dCFI)/h
Eco R I (3055)
Pvu I (3191)
Hind III (3370)
Xho I (3547)
Bgl II (3551)
Bam H I (3805)
Bgl II (3811)
Sph I (4018)
Kpn I (4040)
bovine growth hormone poly A
Sfi I (4358)

Figure 96

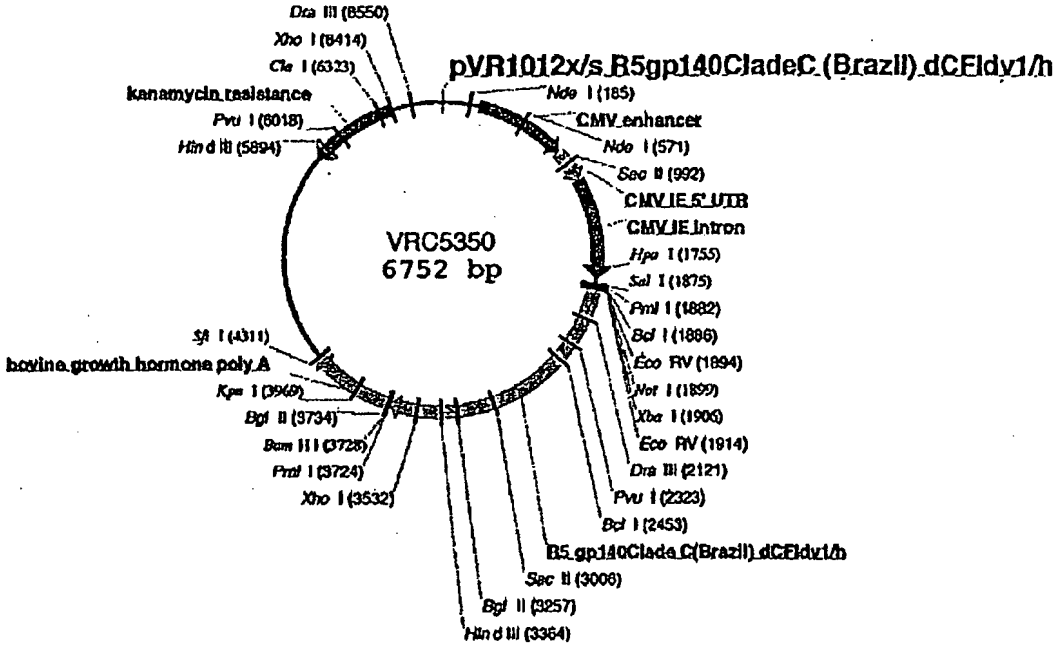

pVR1012x/s B5gp140CladeC (BrazII) dCFIdy1/h
VRC5350
6752 bp
Dra III (6550)
Xho I (6414)
Cla I (6323)
kanamycin resistance
Pvu I (6018)
Hind III (5894)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1905)
Eco RV (1914)
Dra III (2121)
Pvu I (2323)
Bcl I (2453)
B5 gp140Clade C(BrazII) dCFIdy1/h
Sac II (3006)
Bgl II (3257)
Hind III (3364)
Sfi I (4311)
bovine growth hormone poly A
Kpn I (3969)
Bgl II (3734)
Bam HI (3728)
Pml I (3724)
Xho I (3532)

Figure 97

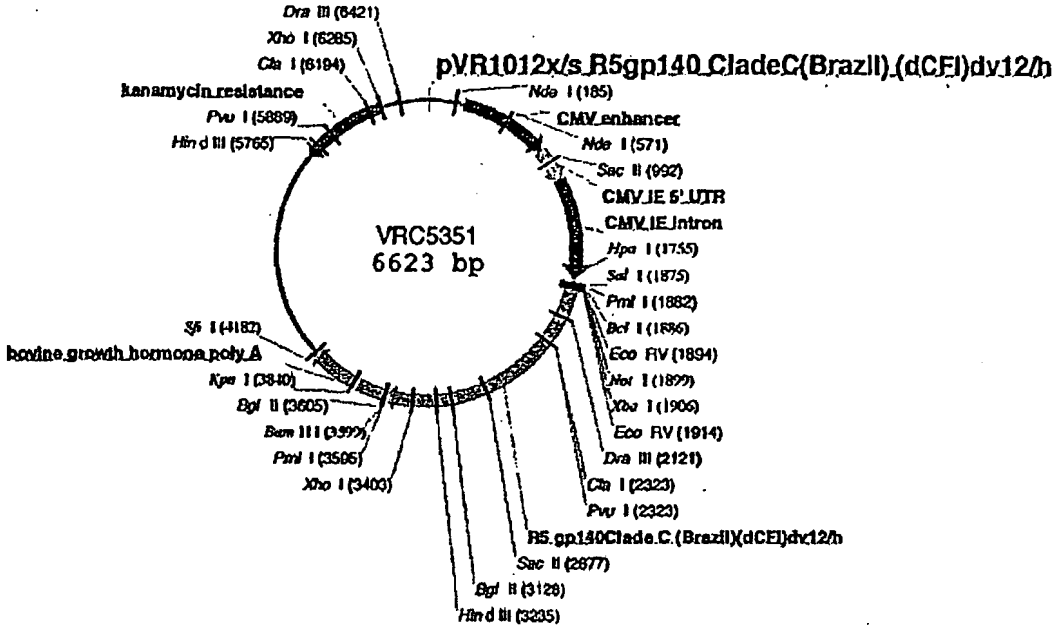

pVR1012x/s R5gp140 CladeC(BrazII) (dCFI)dv12/h
VRC5351
6623 bp
Dra III (6421)
Xho I (6285)
Cla I (6184)
kanamycin resistance
Pvu I (5889)
Hind III (5765)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2323)
Pvu I (2323)
R5.gp140Clade.C.(BrazII)(dCFI)dv12/h
Sac II (2877)
Bgl II (3128)
Hind III (3235)
Xho I (3403)
Pml I (3506)
Bam III (3599)
Bgl II (3605)
Kpn I (3840)
bovine growth hormone poly A
Sfi I (4182)

Figure 98

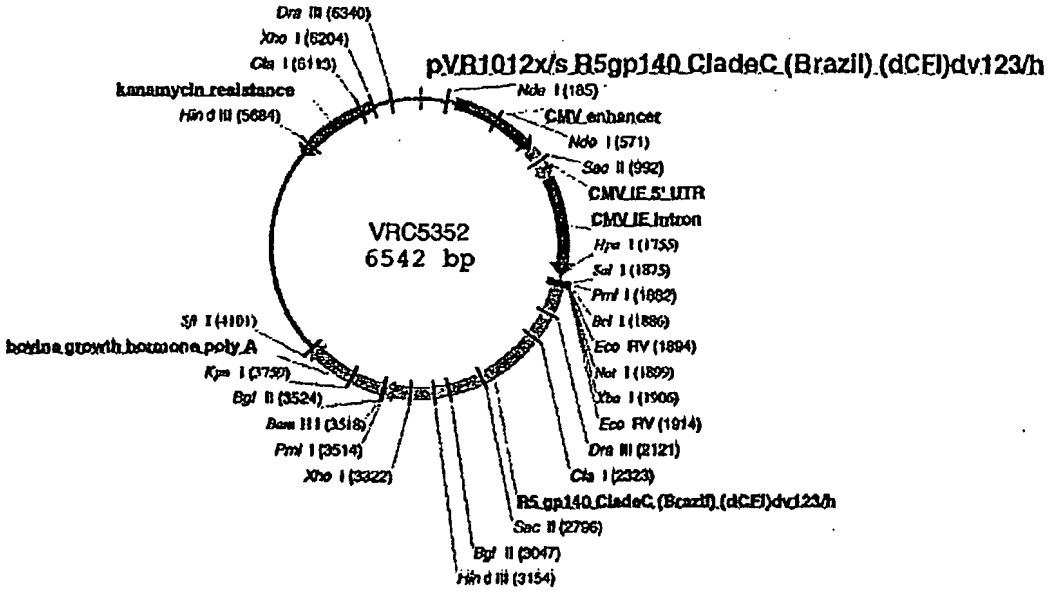

pVR1012x/s R5gp140 CladeC (Brazil) (dCFI)dv123/h
VRC5352
6542 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
bovine growth hormone poly A
R5 gp140 CladeC (Brazil) (dCFI)dv123/h
Dra III (6340)
Xho I (6204)
Cla I (6193)
Hind III (5684)
Nde I (185)
Nde I (571)
Sac II (992)
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2323)
Sac II (2796)
Bgl II (3047)
Hind III (3154)
Sfi I (4101)
Kpn I (3797)
Bgl II (3524)
BamH I (3518)
Pml I (3514)
Xho I (3322)

Figure 99

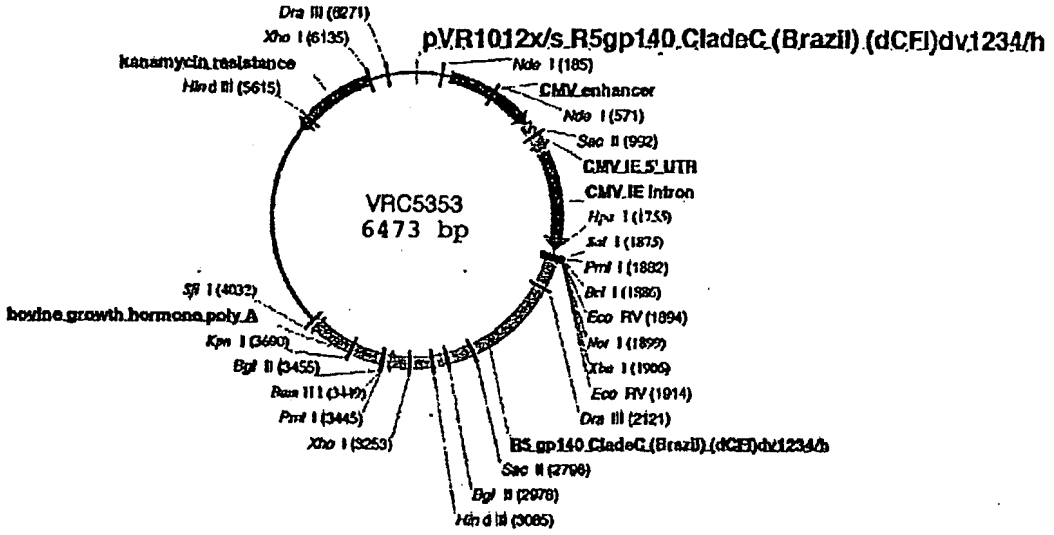

pVR1012x/s_R5gp140_CladeC_(Brazil)_(dCFI)dv1234/h
VRC5353
6473 bp
Dra III (6271)
Xho I (6135)
kanamycin resistance
Hind III (5615)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1759)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1909)
Eco RV (1914)
Dra III (2121)
R5 gp140 CladeC (Brazil) (dCFI)dv1234/h
Sac II (2798)
Bgl II (2978)
Hin d III (3085)
Sfi I (4032)
bovine growth hormone poly A
Kpn I (3690)
Bgl II (3455)
Pml I (3445)
Xho I (3253)

Figure 100

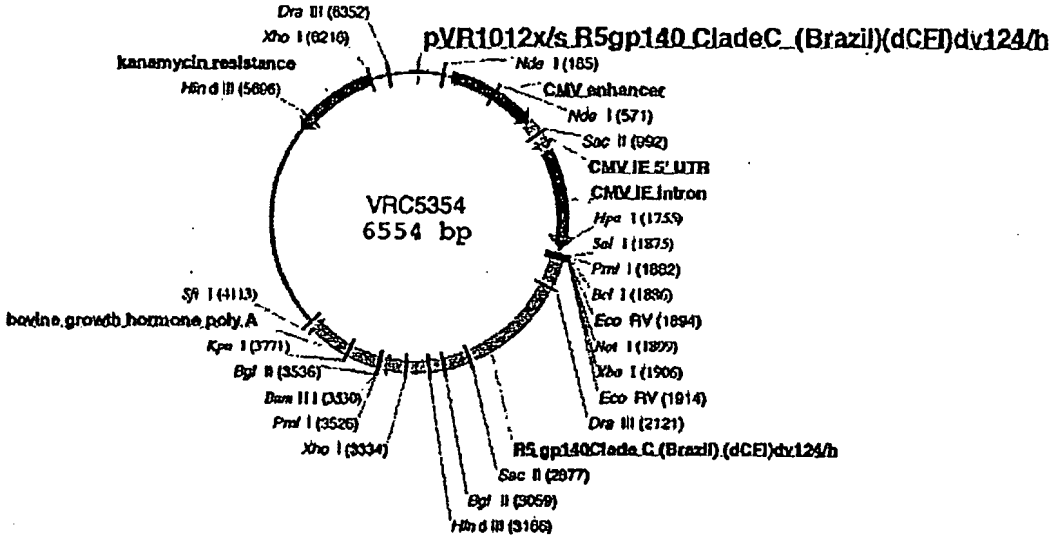

pVR1012x/s R5gp140 CladeC (Brazil)(dCFI)dv124/h
VRC5354
6554 bp
Dra III (6352)
Xho I (6216)
kanamycin resistance
Hind III (5696)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1759)
Sal I (1875)
Pml I (1882)
Bcl I (1890)
Eco RV (1894)
Not I (1909)
Xho I (1906)
Eco RV (1914)
Dra III (2121)
R5 gp140Clade C (Brazil) (dCFI)dv124/h
Sac II (2977)
Bgl II (3059)
Hind III (3166)
Sfi I (3113)
bovine growth hormone poly A
Kpn I (3771)
Bgl II (3536)
Bam III (3530)
Pml I (3526)
Xho I (3334)

Figure 101

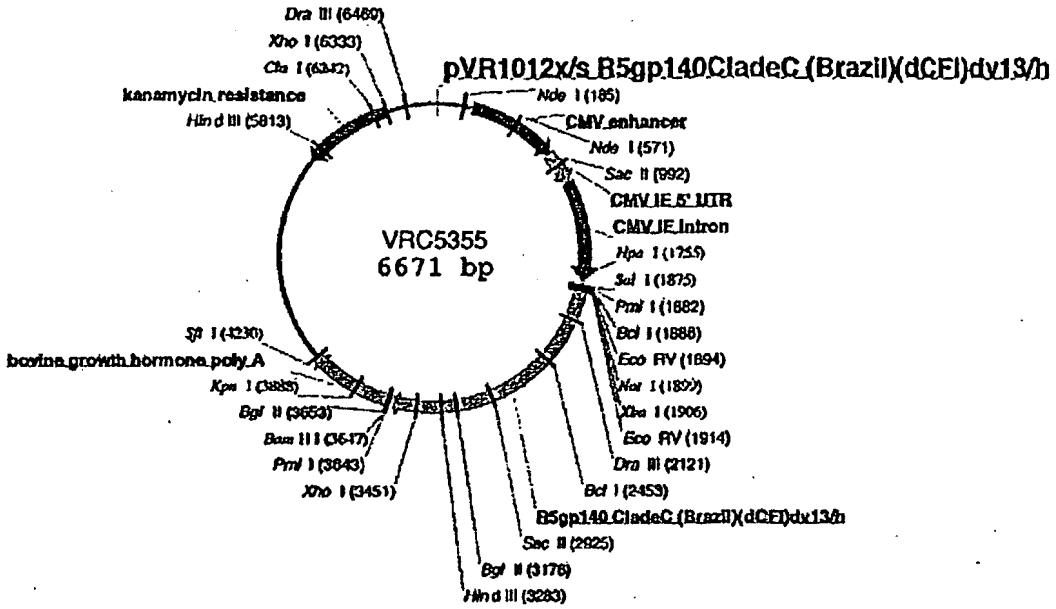

pVR1012x/s B5gp140CladeC (BrazII)(dCFI)dv13/h
VRC5355
6671 bp
Dra III (6469)
Xho I (6333)
Cla I (6342)
kanamycin resistance
Hind III (5813)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1888)
Eco RV (1894)
Nhe I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2453)
B5gp140 CladeC (BrazII)(dCFI)dv13/h
Sac II (2925)
Bgl II (3176)
Hind III (3283)
Xho I (3451)
Pml I (3643)
Bam HI (3647)
Bgl II (3653)
Kpn I (3885)
Sfi I (4230)
bovine growth hormone poly A

Figure 102

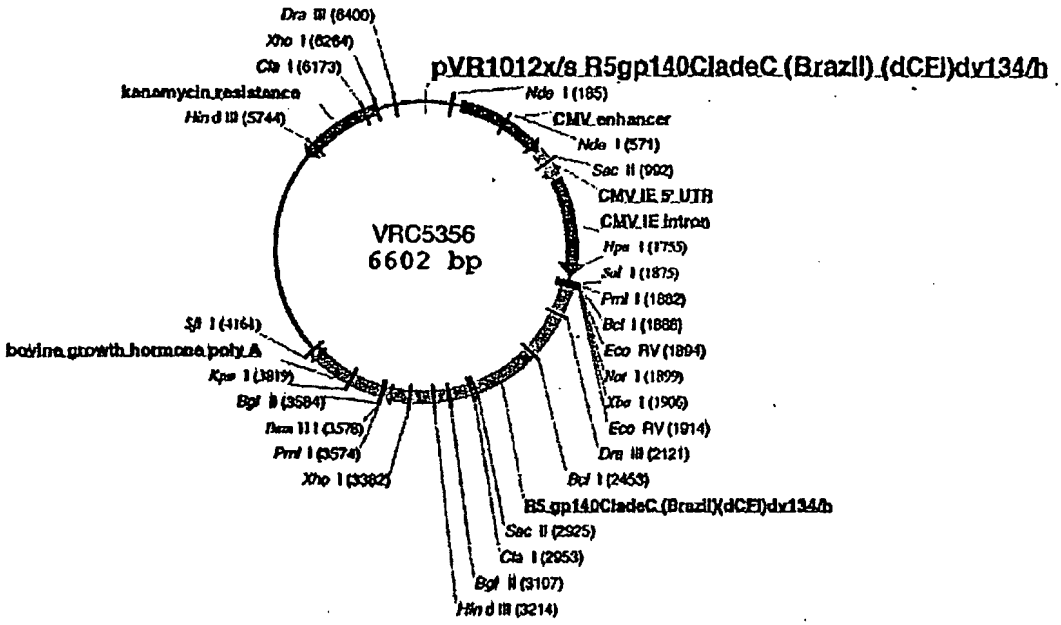

pVR1012x/s R5gp140CladeC (Brazil) (dCFI)dv134/h
VRC5356
6602 bp
Dra III (6400)
Xho I (6264)
Cla I (6173)
kanamycin resistance
Hind III (5744)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1888)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2453)
R5.gp140CladeC.(Brazil)(dCFI)dv134/h
Sac II (2925)
Cla I (2953)
Bgl II (3107)
Hind III (3214)
Sfi I (4164)
bovine growth hormone poly A
Kpn I (3819)
Bgl II (3584)
Pml I (3574)
Xho I (3382)

Figure 103

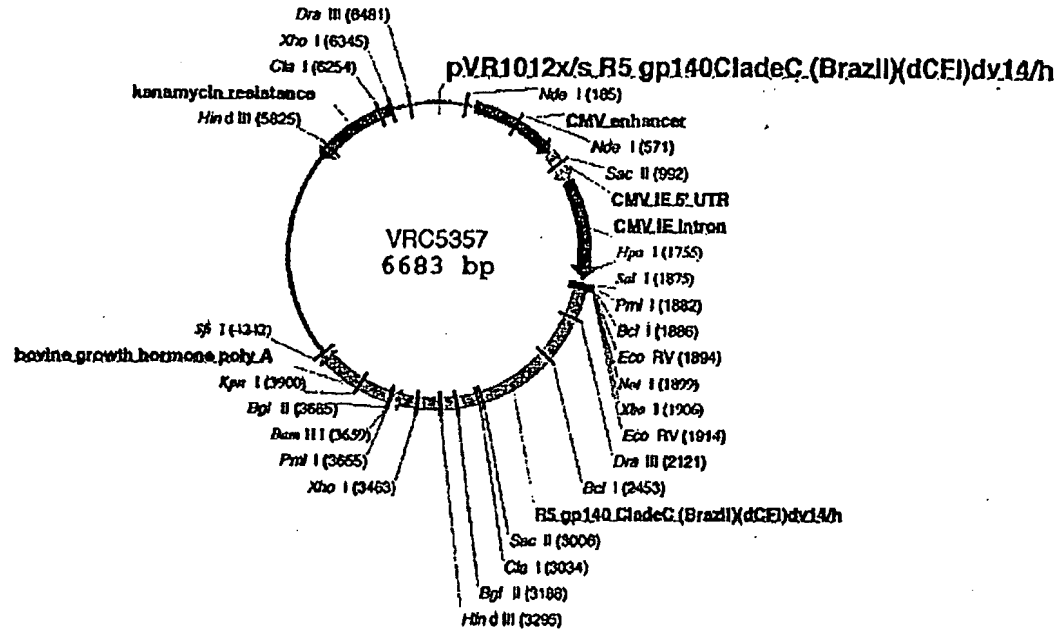

pVR1012x/s.R5.gp140CladeC.(BrazII)(dCFI)dv14/h
VRC5357
6683 bp
Dra III (6481)
Xho I (6345)
Cla I (6254)
kanamycin resistance
Hind III (5825)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Nhe I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2453)
R5.gp140.CladeC.(BrazII)(dCFI)dv14/h
Sac II (3006)
Cla I (3034)
Bpl II (3186)
Hind III (3295)
Xho I (3463)
Pml I (3655)
Bsm III (3659)
Bpl II (3685)
Kpn I (3900)
bovine growth hormone poly A

Figure 104

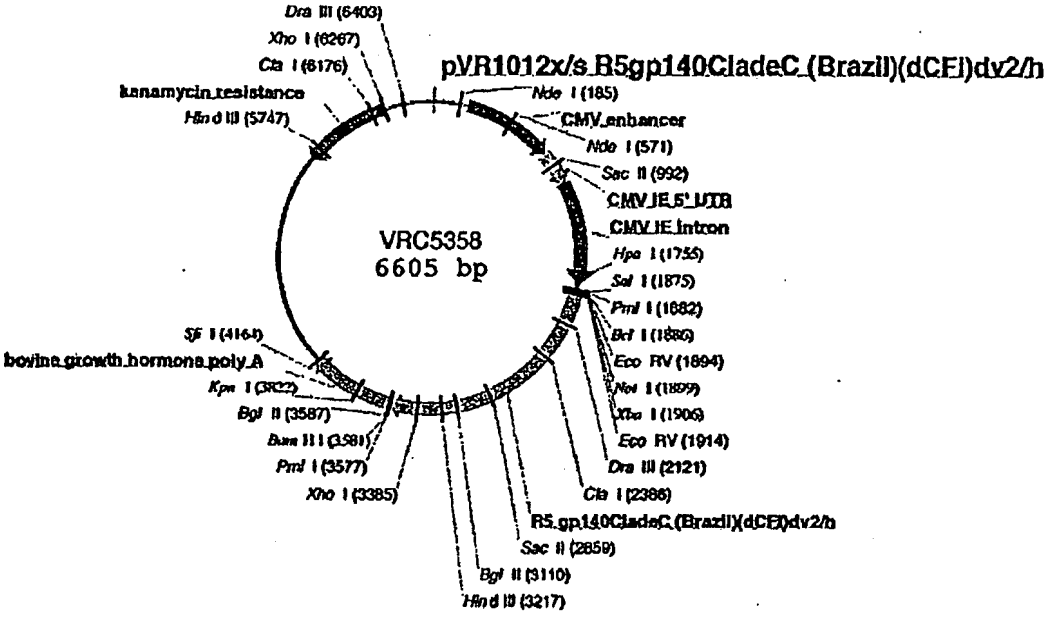

pVR1012x/s R5gp140CladeC (Brazil)(dCFI)dv2/h
VRC5358
6605 bp
Dra III (6403)
Xho I (6267)
Cla I (6176)
kanamycin resistance
Hind III (5747)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2386)
R5 gp140CladeC (Brazil)(dCFI)dv2/h
Sac II (2859)
Bgl II (3110)
Hind III (3217)
Sfi I (4164)
bovine growth hormone poly A
Kpn I (3522)
Bgl II (3587)
Bam HI (3581)
Pml I (3577)
Xho I (3385)

Figure 105

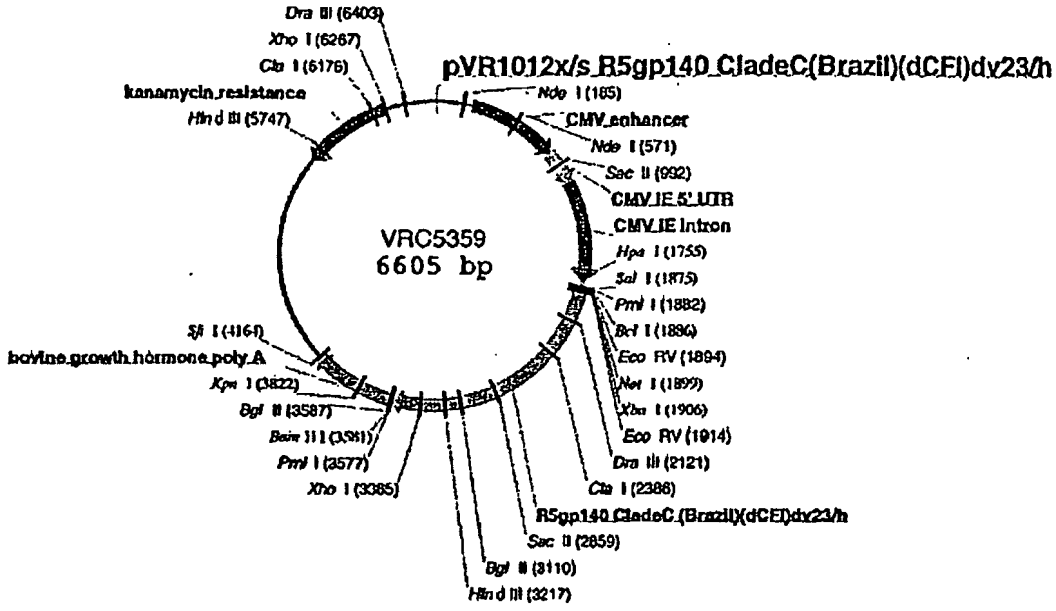

pVR1012x/s R5gp140 CladeC(Brazil)(dCFI)dv23/h
VRC5359
6605 bp
Dra III (6403)
Xho I (6267)
Cla I (6176)
kanamycin resistance
Hind III (5747)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1890)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2388)
R5gp140 CladeC (Brazil)(dCFI)dv23/h
Sac II (2859)
Bgl II (3110)
Hind III (3217)
Sfi I (4164)
bovine growth hormone poly A
Xba I (3822)
Bgl II (3587)
Pml I (3577)
Xho I (3385)

Figure 106

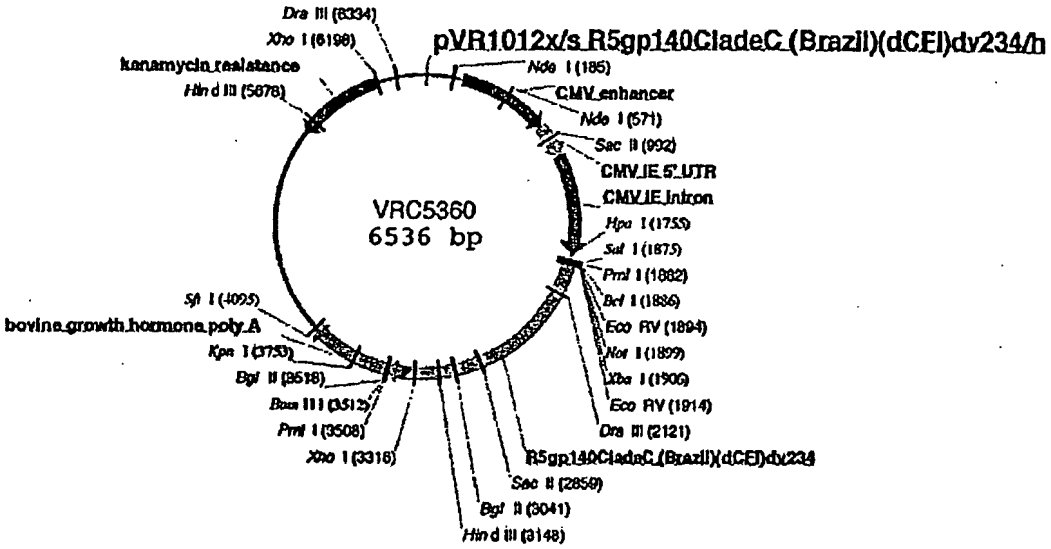

pVR1012x/s R5gp140CladeC (Brazil)(dCFI)dv234/h
VRC5360
6536 bp
Dra III (6334)
Xho I (6198)
kanamycin resistance
Hind III (5878)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
R5gp140CladeC (Brazil)(dCFI)dv234
Sac II (2859)
Bgl II (3041)
Hind III (3148)
Xho I (3316)
Pml I (3508)
Bsa III (3512)
Bgl II (3518)
Kpn I (3753)
Sfi I (4095)
bovine growth hormone poly A

Figure 107

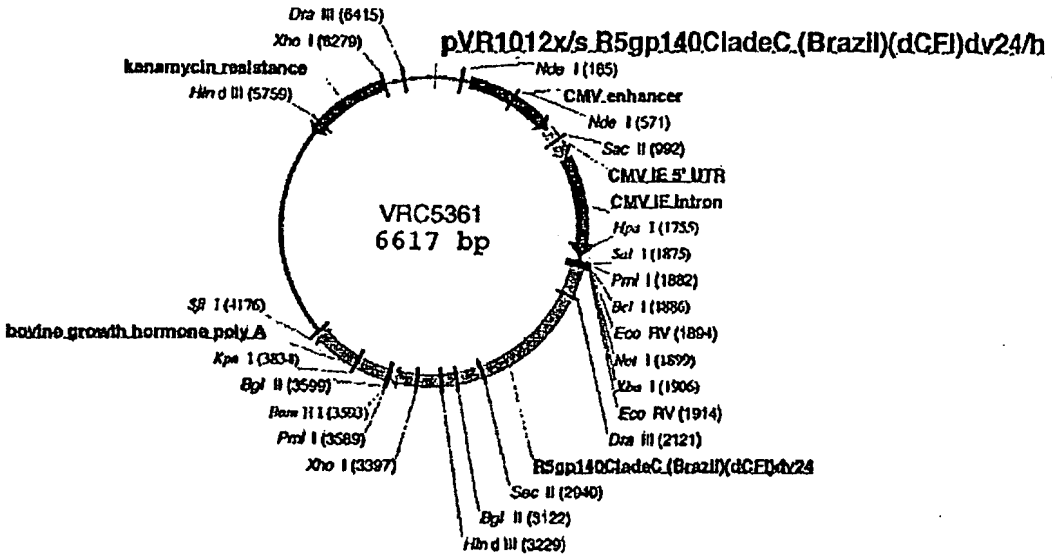

pVR1012x/s R5gp140CladeC (Brazil)(dCFI)dv24/h
VRC5361
6617 bp
Dra III (6415)
Xho I (6279)
kanamycin resistance
Hind III (5759)
Nde I (165)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
R5gp140CladeC (Brazil)(dCFI)dv24
Sac II (2940)
Bgl II (3122)
Hind III (3229)
Xho I (3397)
Pml I (3589)
BamH I (3593)
Bgl II (3599)
Kpn I (3834)
SfI I (4176)
bovine growth hormone poly A

Figure 108

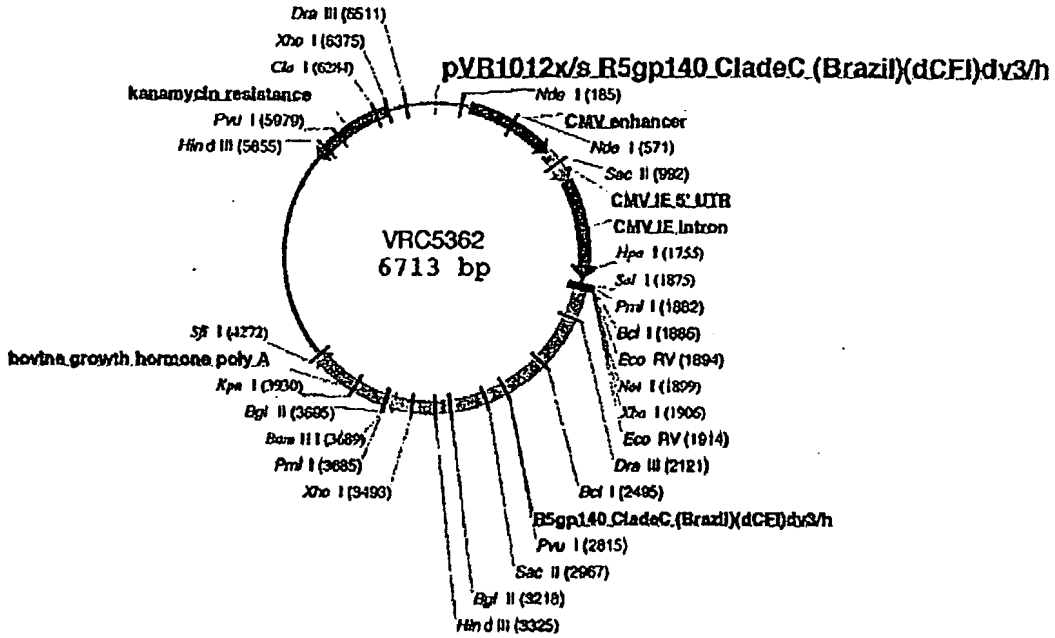

pVR1012x/s R5gp140 CladeC (Brazil)(dCFI)dv3/h
VRC5362
6713 bp
Dra III (6511)
Xho I (6375)
Cla I (6264)
kanamycin resistance
Pvu I (5979)
Hind III (5855)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Nsi I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
R5gp140 CladeC (Brazil)(dCFI)dv3/h
Pvu I (2815)
Sac II (2967)
Bgl II (3218)
Hind III (3325)
Sfi I (4272)
bovine growth hormone poly A
Kpn I (3930)
Bgl II (3695)
Bam HI (3689)
Pml I (3685)
Xho I (3493)

Figure 109

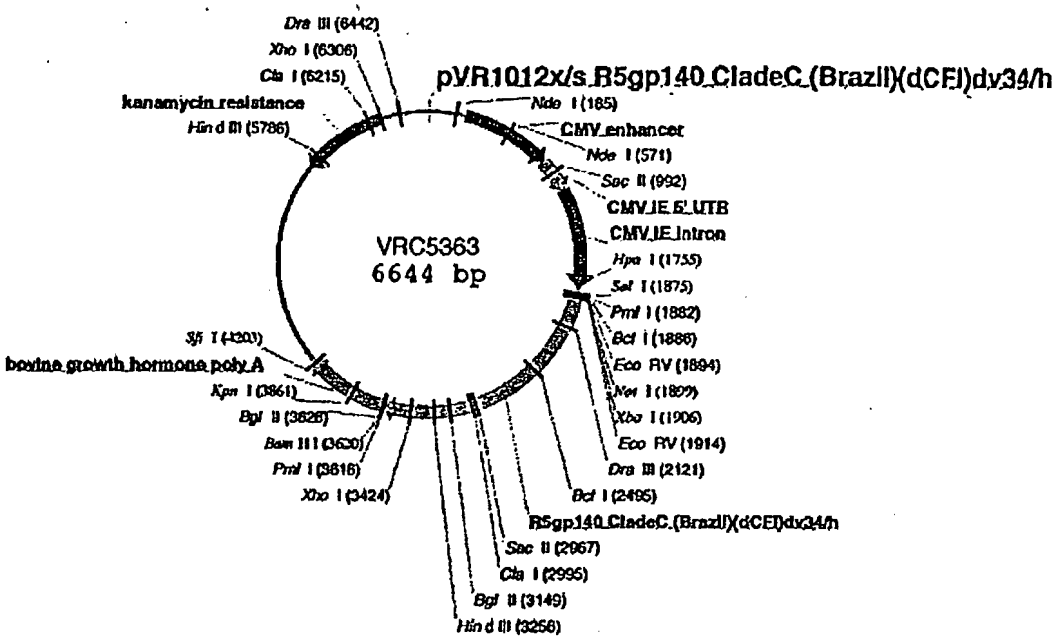

pVR1012x/s.R5gp140.CladeC.(Brazil)(dCFI)dv34/h
VRC5363
6644 bp
Dra III (6442)
Xho I (6306)
Cla I (6215)
kanamycin resistance
Hind III (5786)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1897)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
R5gp140.CladeC.(Brazil)(dCFI)dv34/h
Sac II (2967)
Cla I (2995)
Bgl II (3149)
Hind III (3256)
Sfi I (3303)
bovine growth hormone poly A
Kpn I (3861)
Bgl II (3626)
Bam HI (3620)
Pml I (3616)
Xho I (3424)

Figure 110

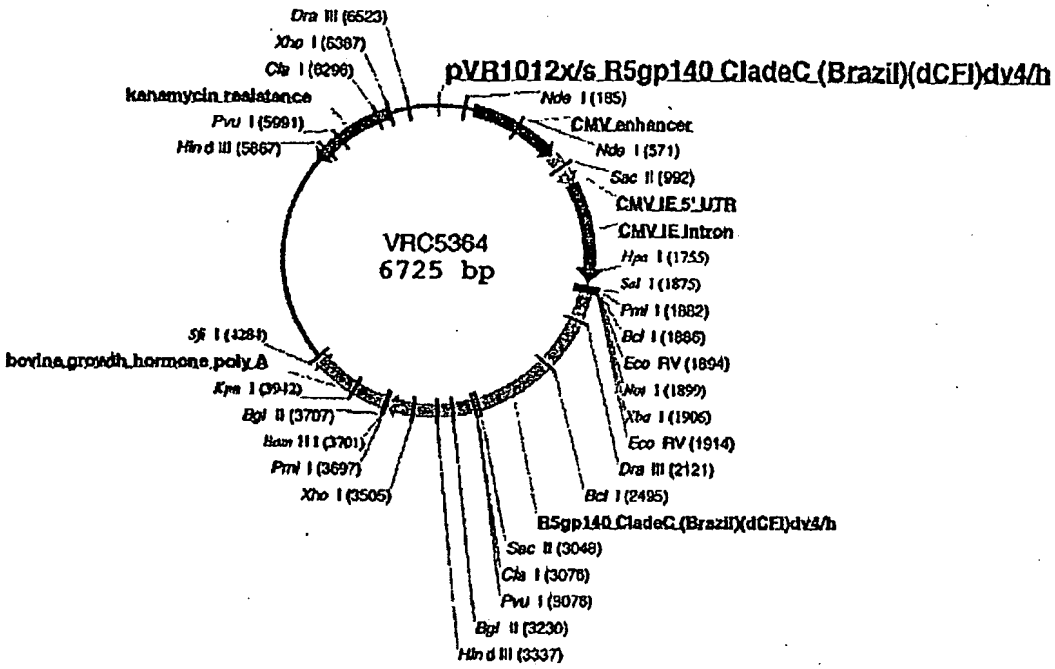

pVR1012x/s R5gp140 CladeC (Brazil)(dCFI)dv4/h
VRC5364
6725 bp
Dra III (6523)
Xho I (6387)
Cla I (6296)
kanamycin resistance
Pvu I (5991)
Hind III (5867)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
R5gp140 CladeC (Brazil)(dCFI)dv4/h
Sac II (3048)
Cla I (3076)
Pvu I (3078)
Bgl II (3230)
Hind III (3337)
Sfi I (4284)
bovine growth hormone poly A
Kpn I (3912)
Bgl II (3707)
Bam HI (3701)
Pml I (3697)
Xho I (3505)

Figure 111

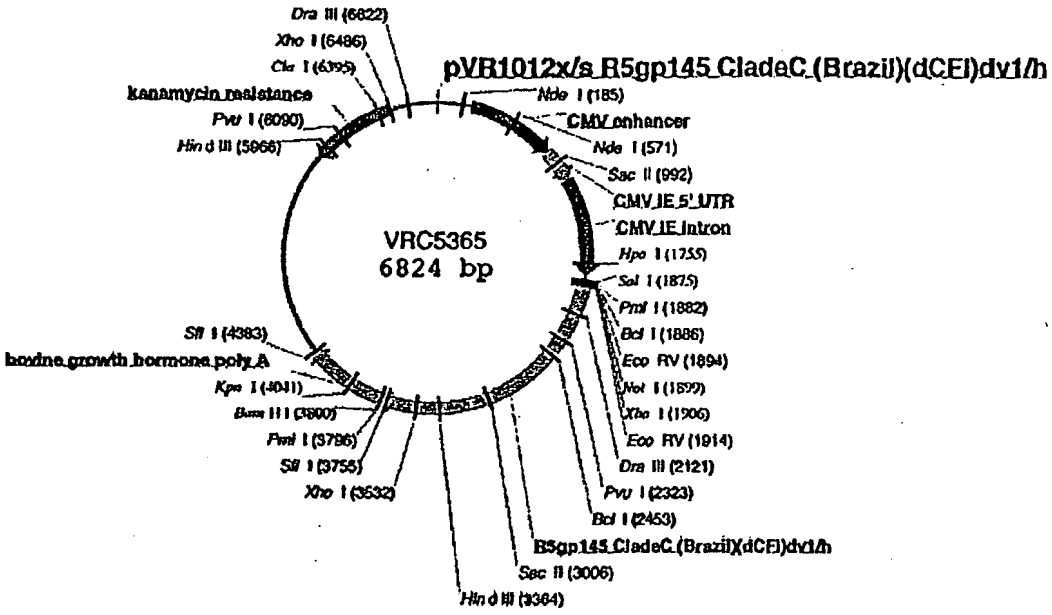

pVR1012x/s R5gp145 CladeC (Brazil)(dCFI)dv1/h
VRC5365
6824 bp
Dra III (6822)
Xho I (6486)
Cla I (6395)
kanamycin resistance
Pvu I (6090)
Hind III (5966)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Pvu I (2323)
Bcl I (2453)
R5gp145 CladeC (Brazil)(dCFI)dv1/h
Sac II (3006)
Hind III (3364)
Xho I (3532)
Sfi I (3755)
Pml I (3796)
Kpn I (4041)
Sfi I (4383)
bovine growth hormone poly A

Figure 112

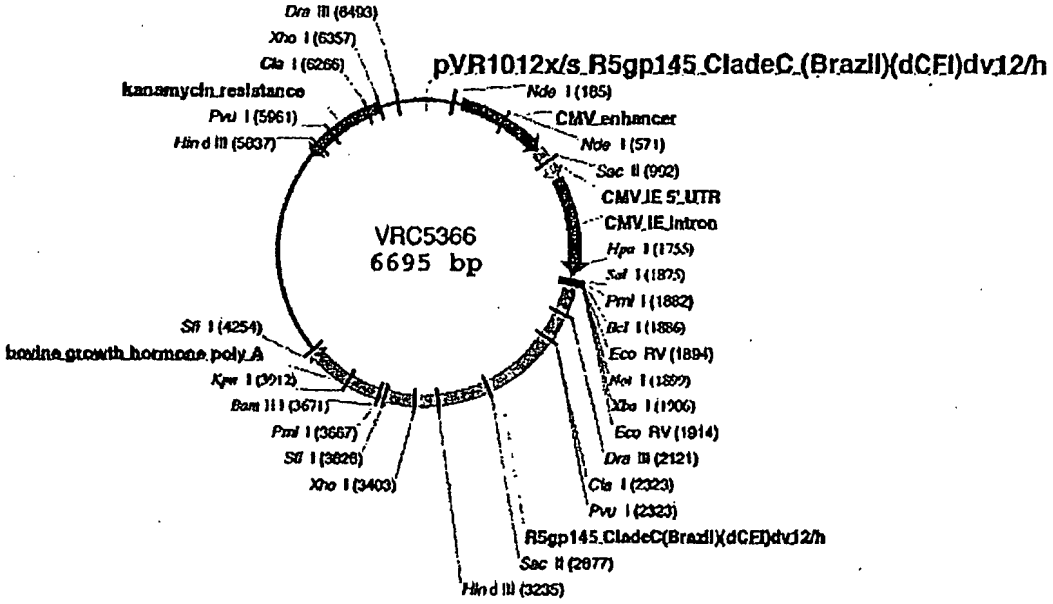

pVR1012x/s_R5gp145_CladeC_(Brazil)(dCFI)dv12/h
VRC5366
6695 bp
Dra III (6493)
Xho I (6357)
Cla I (6266)
kanamycin resistance
Pvu I (5961)
Hind III (5837)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (902)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2323)
Pvu I (2323)
R5gp145 CladeC(Brazil)(dCFI)dv12/h
Sac II (2677)
Hind III (3235)
Xho I (3403)
Sfi I (3626)
Pml I (3667)
Bam HI (3671)
Kpn I (3912)
Sfi I (4254)
bovine growth hormone poly A

Figure 113

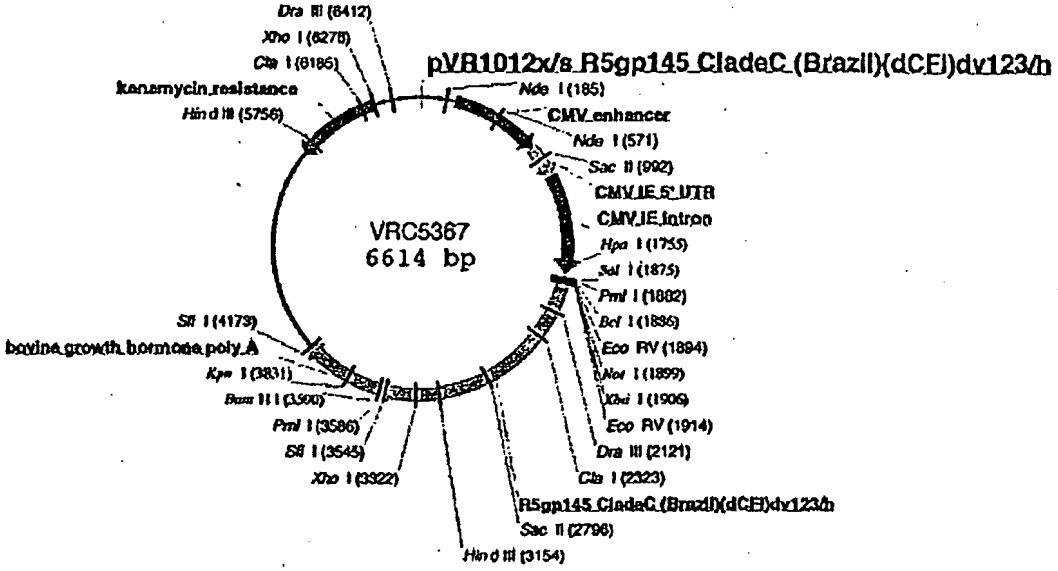

pVR1012x/s R5gp145 CladeC (Brazil)(dCFI)dv123/h
VRC5367
6614 bp
Dra III (6412)
Xho I (6278)
Cla I (6186)
kanamycin resistance
Hind III (5756)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1909)
Eco RV (1914)
Dra III (2121)
Cla I (2323)
R5gp145 CladeC (Brazil)(dCFI)dv123/h
Sac II (2796)
Hind III (3154)
Sfi I (4179)
bovine growth hormone poly A
Kpn I (3831)
Bam HI (3500)
Pml I (3586)
Sfi I (3545)
Xho I (3322)

Figure 114

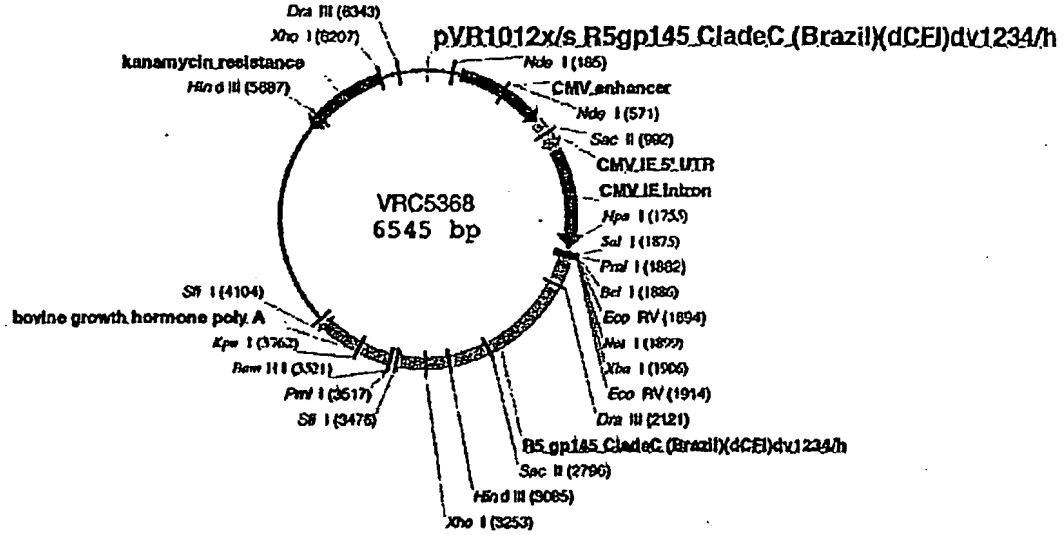

pVR1012x/s_R5gp145_CladeC_(Brazil)(dCFI)dv1234/h
VRC5368
6545 bp
Dra III (6343)
Xho I (6207)
kanamycin resistance
Hind III (5887)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1753)
Sal I (1875)
Pml I (1882)
Bcl I (1888)
Eco RV (1894)
Nru I (1897)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
R5 gp145 CladeC (Brazil)(dCFI)dv1234/h
Sac II (2796)
Hind III (3085)
Xho I (3253)
Sfi I (4104)
bovine growth hormone poly A
Kpn I (3762)
BamH I (3521)
Pml I (3517)
Sfi I (3476)

Figure 115

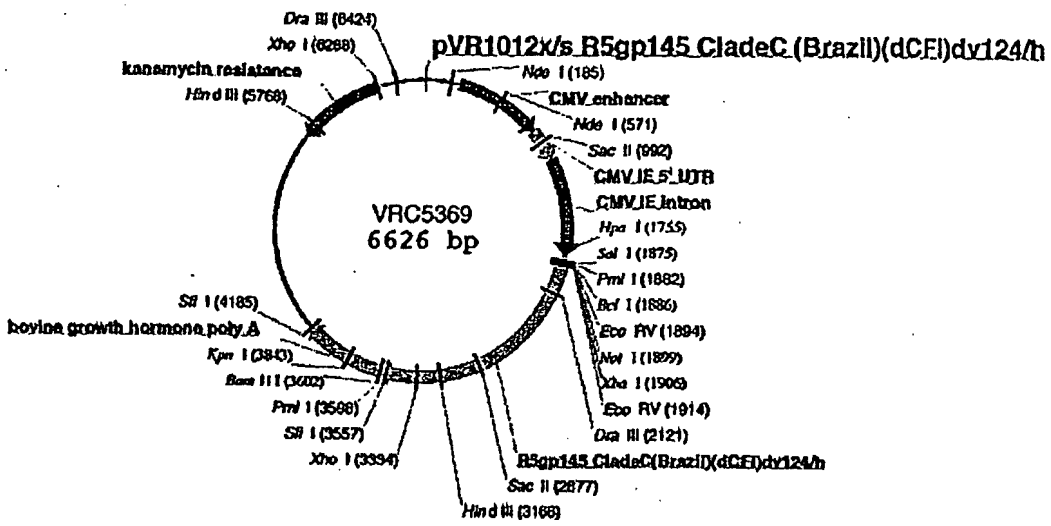

pVR1012x/s R5gp145 CladeC (Brazil)(dCFI)dv124/h
VRC5369
6626 bp
Dra III (6424)
Xho I (6288)
kanamycin resistance
Hind III (5768)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
R5gp145 CladeC(Brazil)(dCFI)dv124/h
Sac II (2877)
Hind III (3166)
Xho I (3394)
Sfi I (3557)
Pml I (3598)
Bsa HI I (3602)
Kpn I (3843)
Sfi I (4185)
bovine growth hormone poly A

Figure 116

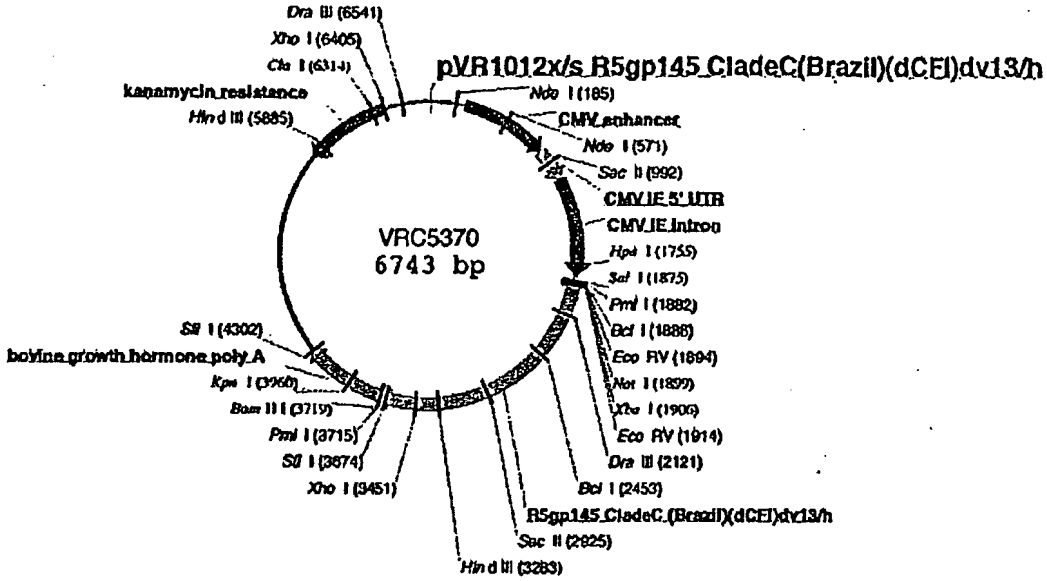

pVR1012x/s R5gp145 CladeC(Brazil)(dCFI)dv13/h
VRC5370
6743 bp
Dra III (6541)
Xho I (6405)
Cla I (6314)
kanamycin resistance
Hind III (5885)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1888)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2453)
R5gp145 CladeC (Brazil)(dCFI)dv13/h
Sac II (2825)
Hind III (3283)
Xho I (3451)
Sfi I (3674)
Pml I (3715)
BamH I (3719)
Kpn I (3960)
Sfi I (4302)
bovine growth hormone poly A

Figure 117

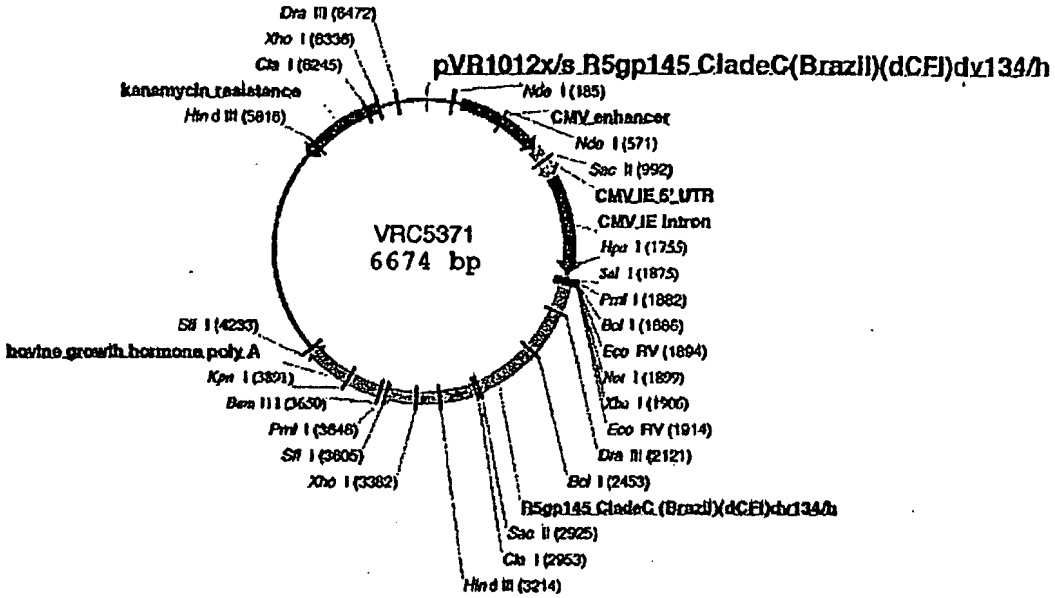

pVR1012x/s R5gp145 CladeC(Brazil)(dCFI)dv134/h
VRC5371
6674 bp
Dra III (6472)
Xho I (6336)
Cla I (6245)
kanamycin resistance
Hind III (5816)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bal I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1900)
Eco RV (1914)
Dra III (2121)
Bal I (2453)
R5gp145 CladeC (Brazil)(dCFI)dv134/h
Sac II (2925)
Cla I (2953)
Hind III (3214)
Sfi I (4233)
bovine growth hormone poly A
Kpn I (3891)
Ban III (3630)
Pml I (3646)
Sfi I (3805)
Xho I (3382)

Figure 118

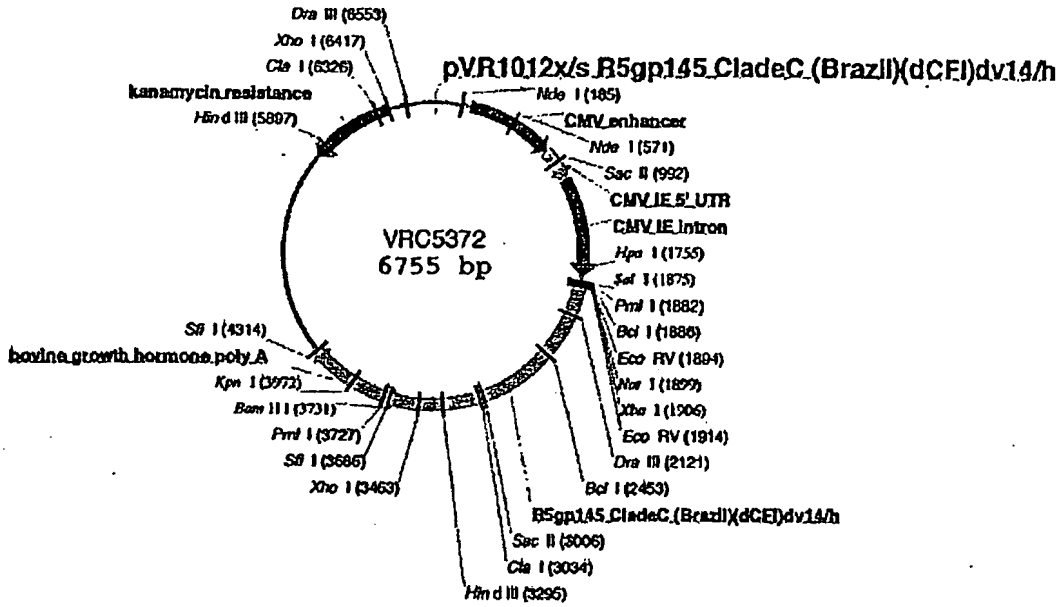

pVR1012x/s B5gp145 CladeC (BrazII)(dCFI)dv14/h
VRC5372
6755 bp
Dra III (6553)
Xho I (6417)
Cla I (6326)
kanamycin resistance
Hind III (5897)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Nhe I (1899)
Xho I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2453)
B5gp145 CladeC (BrazII)(dCFI)dv14/h
Sac II (3006)
Cla I (3034)
Hind III (3295)
Xho I (3463)
Sfi I (3686)
Pml I (3727)
Bam HI (3731)
Kpn I (3972)
bovine growth hormone poly A
Sfi I (4314)

Figure 119

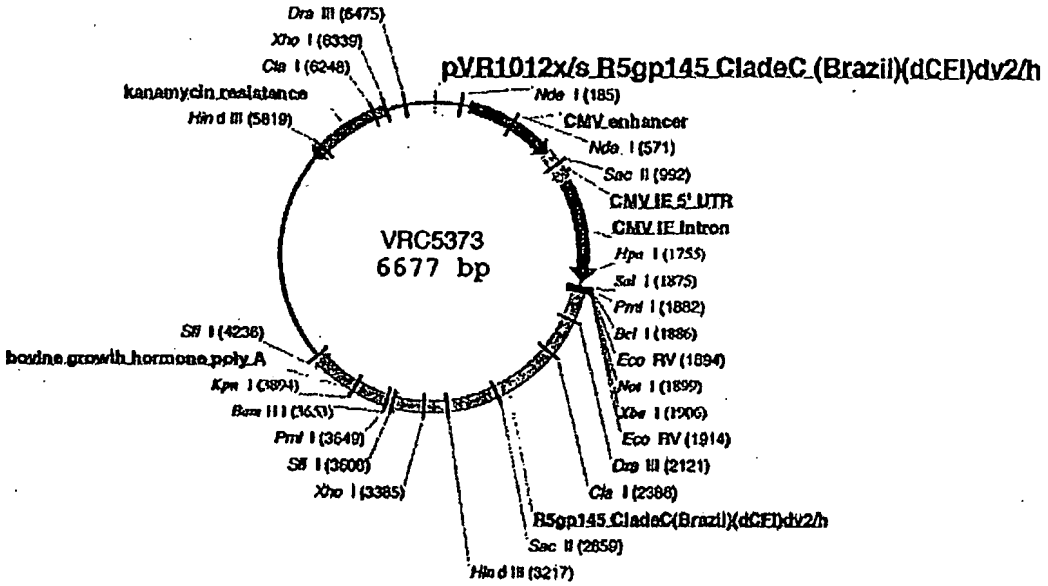

pVR1012x/s B5gp145 CladeC (Brazil)(dCFI)dv2/h
VRC5373
6677 bp
Dra III (6475)
Xho I (6339)
Cla I (6248)
kanamycin resistance
Hind III (5819)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2388)
B5gp145 CladeC(Brazil)(dCFI)dv2/h
Sac II (2659)
Hind III (3217)
Xho I (3385)
Sfi I (3600)
Pml I (3649)
BsmB I (3653)
Kpn I (3894)
Sfi I (4236)
bovine growth hormone poly A

Figure 120

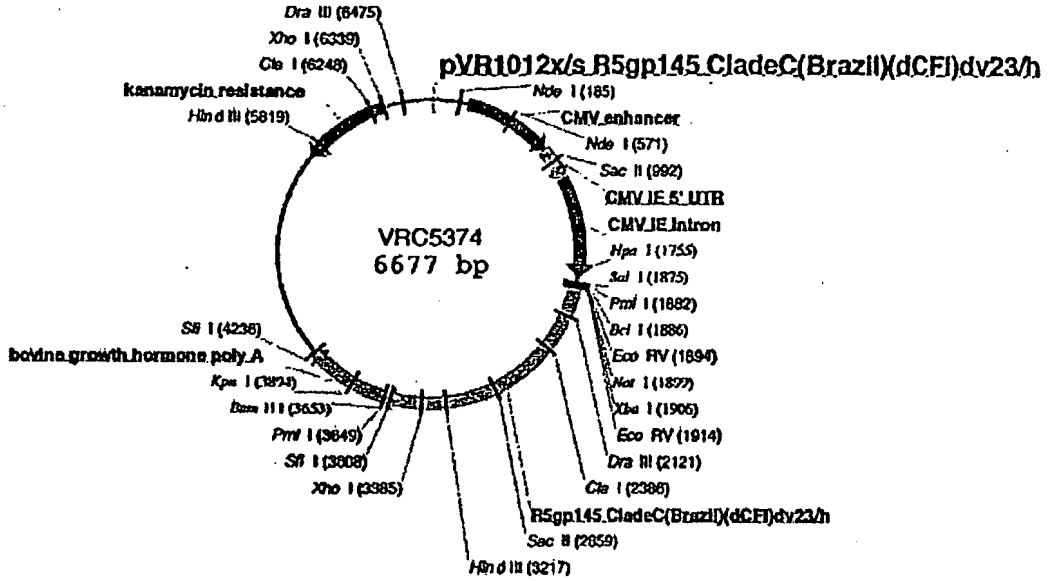

pVR1012x/s R5gp145 CladeC(Brazil)(dCFI)dv23/h
VRC5374
6677 bp
Dra III (6475)
Xho I (6339)
Cla I (6248)
kanamycin resistance
Hind III (5819)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1897)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Cla I (2386)
R5gp145 CladeC(Brazil)(dCFI)dv23/h
Sac II (2659)
Hind III (3217)
Xho I (3985)
Sfi I (4008)
Pml I (4049)
BamH I (4053)
Kpn I (4074)
bovine growth hormone poly A
Sfi I (4236)

Figure 121

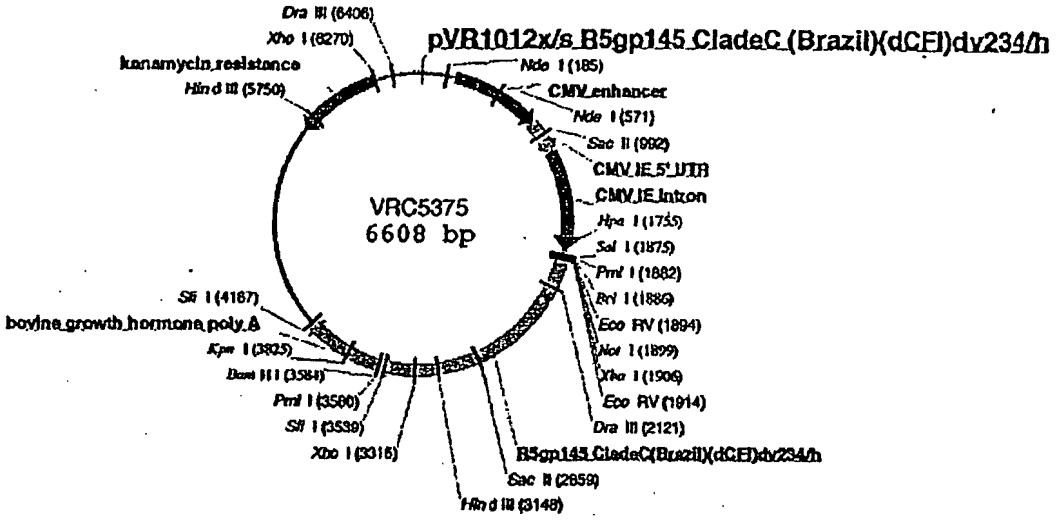

pVR1012x/s B5gp145 CladeC (Brazil)(dCFI)dv234/h
VRC5375
6608 bp
Dra III (6406)
Xho I (6270)
kanamycin resistance
Hind III (5750)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Rsr I (1889)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
B5gp145 CladeC(Brazil)(dCFI)dv234/h
Sac II (2859)
Hind III (3148)
Xho I (3316)
Sfi I (3539)
Pml I (3580)
Bam HI (3584)
Kpn I (3825)
Sfi I (4167)
bovine growth hormone poly A

Figure 122

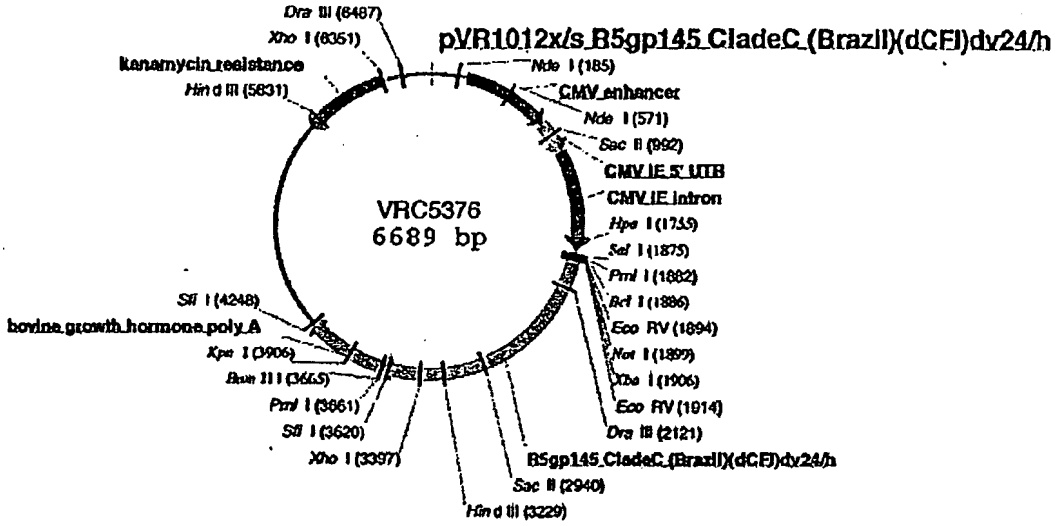

pVR1012x/s_B5gp145_CladeC_(BrazII)(dCFI)dv24/h
VRC5376
6689 bp
Dra III (6487)
Xho I (6351)
kanamycin resistance
Hind III (5831)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
B5gp145_CladeC_(BrazII)(dCFI)dv24/h
Sac II (2940)
Hind III (3229)
Xho I (3397)
Sfi I (3620)
Pml I (3661)
Bsm III I (3665)
Xba I (3906)
bovine growth hormone poly A
Sfi I (4248)

Figure 123

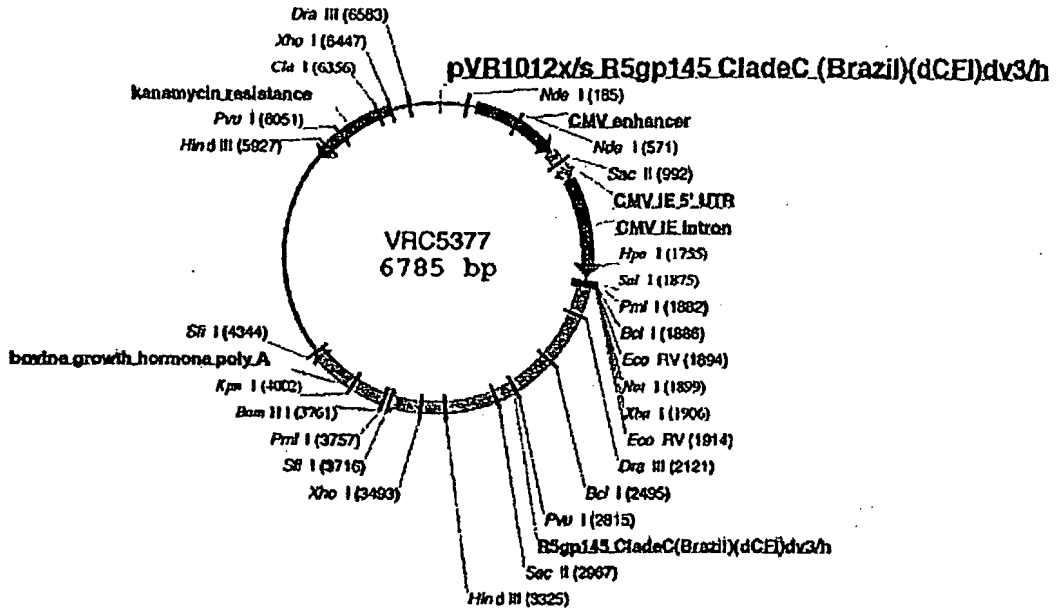

pVR1012x/s R5gp145 CladeC (Brazil)(dCFI)dv3/h
VRC5377
6785 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
bovine growth hormone poly A
R5gp145 CladeC(Brazil)(dCFI)dv3/h
Dra III (6583)
Xho I (6447)
Cla I (6356)
Pvu I (6051)
Hind III (5927)
Nde I (185)
Nde I (571)
Sac II (992)
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Nhe I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
Pvu I (2815)
Sac II (2987)
Hind III (3325)
Xho I (3493)
Sfi I (3716)
Pml I (3757)
Bam HI (3761)
Kpn I (4002)
Sfi I (4344)

Figure 124

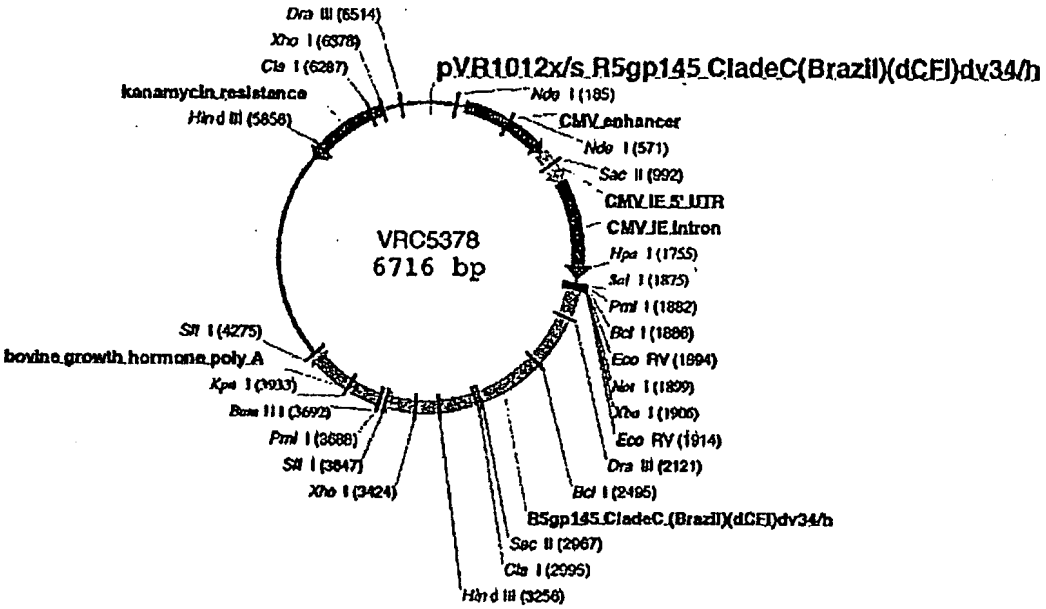

pVR1012x/s_R5gp145_CladeC(Brazil)(dCFI)dv34/h
VRC5378
6716 bp
Dra III (6514)
Xho I (6378)
Cla I (6287)
kanamycin resistance
Hind III (5858)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Nhe I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bcl I (2495)
R5gp145_CladeC_(Brazil)(dCFI)dv34/h
Sac II (2967)
Cla I (2995)
Hind III (3256)
Xho I (3424)
Pml I (3688)
Sfi I (3847)
Bsm I I I (3692)
Kpn I (3933)
bovine growth hormone poly A
Sfi I (4275)

Figure 125

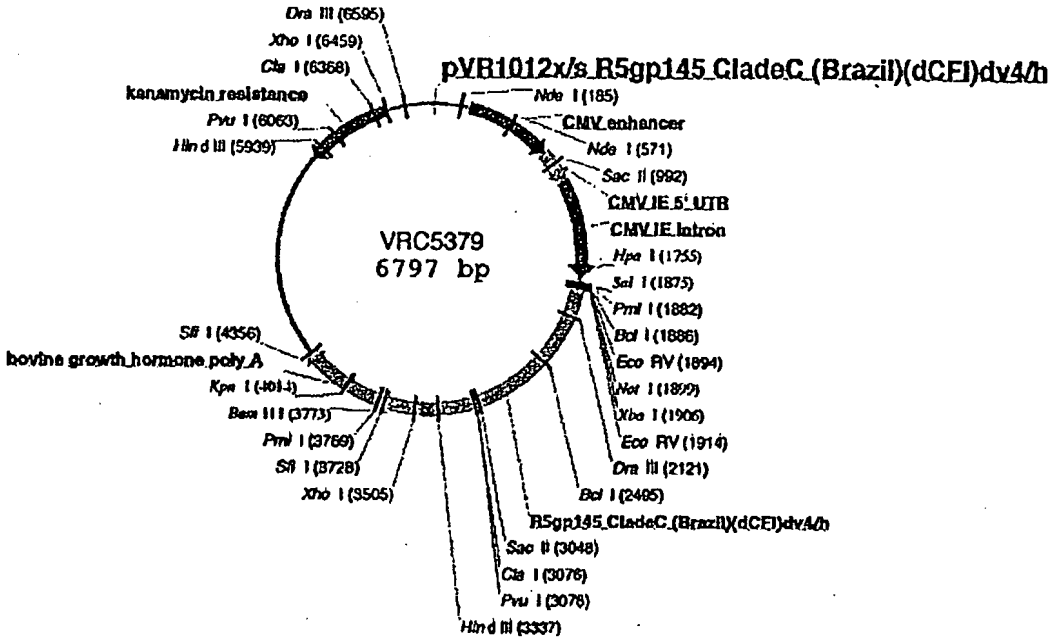

pVR1012x/s R5gp145 CladeC (Brazil)(dCFI)dv4/h
VRC5379
6797 bp
Dra III (6595)
Xho I (6459)
Cla I (6368)
kanamycin resistance
Pvu I (6063)
Hind III (5939)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bal I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Dra III (2121)
Bal I (2485)
R5gp145 CladeC (Brazil)(dCFI)dv4/h
Sac II (3048)
Cla I (3076)
Pvu I (3078)
Hind III (3337)
Xho I (3505)
Sfi I (3728)
Pml I (3769)
Bsa I I I (3773)
Kpn I (4014)
bovine growth hormone poly A
Sfi I (4356)

Figure 126

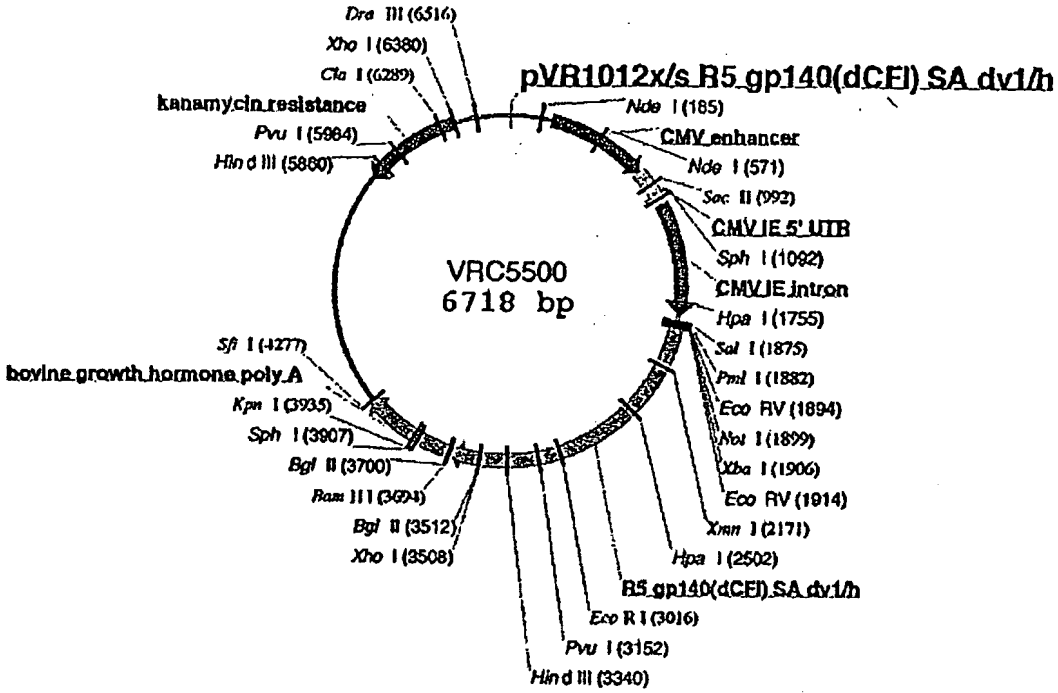

pVR1012x/s R5 gp140(dCFI) SA dv1/h
VRC5500
6718 bp
Dra III (6516)
Xho I (6380)
Cla I (6289)
kanamycin resistance
Pvu I (5984)
Hind III (5860)
Nde I (185)
CMV enhancer
Nde I (571)
Soc II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2502)
R5 gp140(dCFI) SA dv1/h
Eco R I (3016)
Pvu I (3152)
Hind III (3340)
Sfi I (4277)
bovine growth hormone poly A
Kpn I (3935)
Sph I (3907)
Bgl II (3700)
Bam III (3694)
Bgl II (3512)
Xho I (3508)

Figure 127

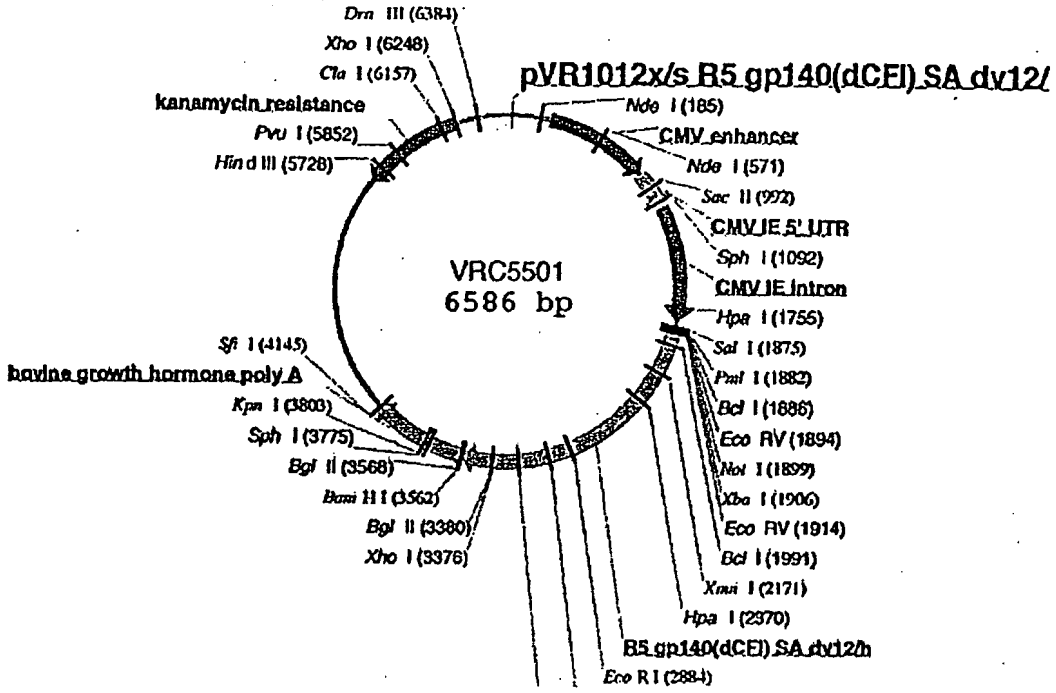

pVR1012x/s R5 gp140(dCFI) SA dv12/
VRC5501
6586 bp
Drn III (6384)
Xho I (6248)
Cla I (6157)
kanamycin resistance
Pvu I (5852)
Hind III (5728)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2370)
R5 gp140(dCFI) SA dv12/h
Eco R I (2884)
Sfi I (4145)
bovine growth hormone poly A
Kpn I (3803)
Sph I (3775)
Bgl II (3568)
Bam H I (3562)
Bgl II (3380)
Xho I (3376)

Figure 128

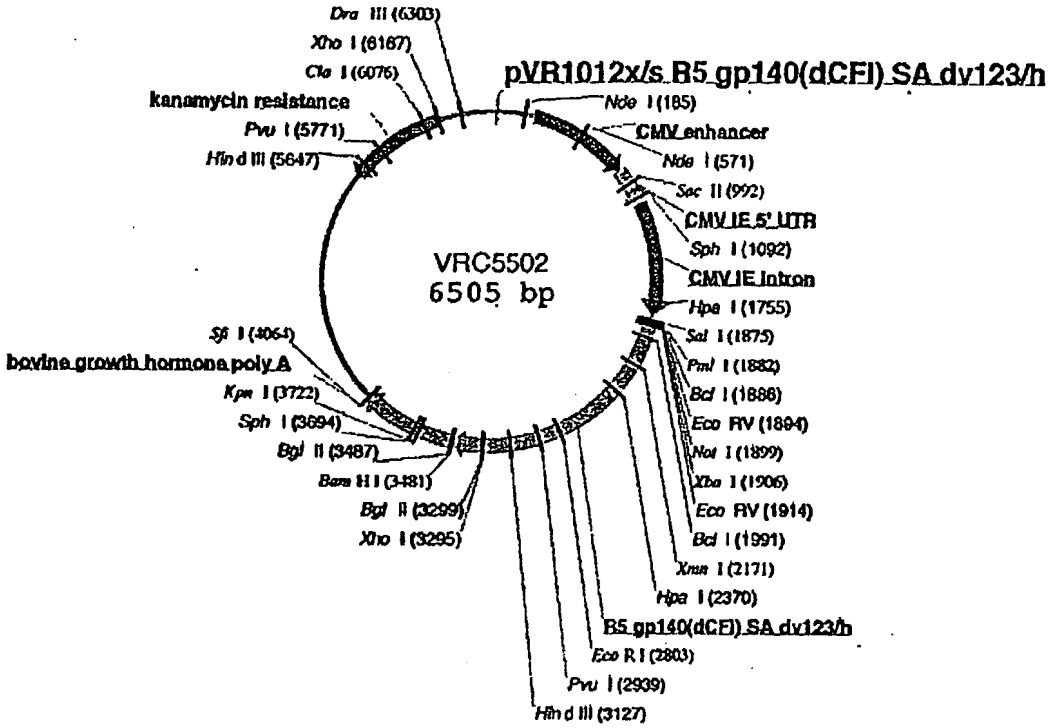

pVR1012x/s B5 gp140(dCFI) SA dv123/h
VRC5502
6505 bp
Dra III (6303)
Xho I (6167)
Cla I (6076)
kanamycin resistance
Pvu I (5771)
Hind III (5647)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2370)
B5 gp140(dCFI) SA dv123/h
Eco R I (2803)
Pvu I (2939)
Hind III (3127)
Sfi I (3064)
bovine growth hormone poly A
Kpn I (3722)
Sph I (3694)
Bgl II (3487)
Bam H I (3481)
Bgl II (3299)
Xho I (3295)

Figure 129

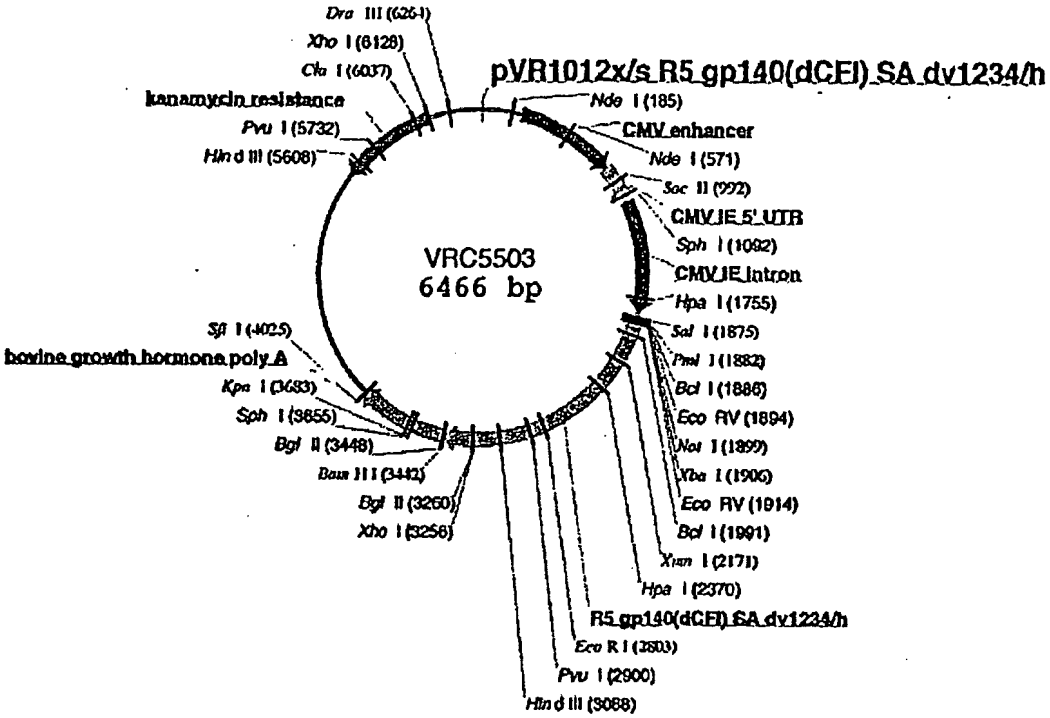

pVR1012x/s R5 gp140(dCFI) SA dv1234/h
VRC5503
6466 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
bovine growth hormone poly A
R5 gp140(dCFI) SA dv1234/h
Dra III (626-)
Xho I (6128)
Cla I (6037)
Pvu I (5732)
Hind III (5608)
Nde I (185)
Nde I (571)
Sac II (992)
Sph I (1092)
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2370)
Eco R I (2803)
Pvu I (2900)
Hind III (3068)
Sfi I (402-)
Kpn I (3683)
Sph I (3855)
Bgl II (3448)
Bam HI (3442)
Bgl II (3260)
Xho I (3256)

Figure 130

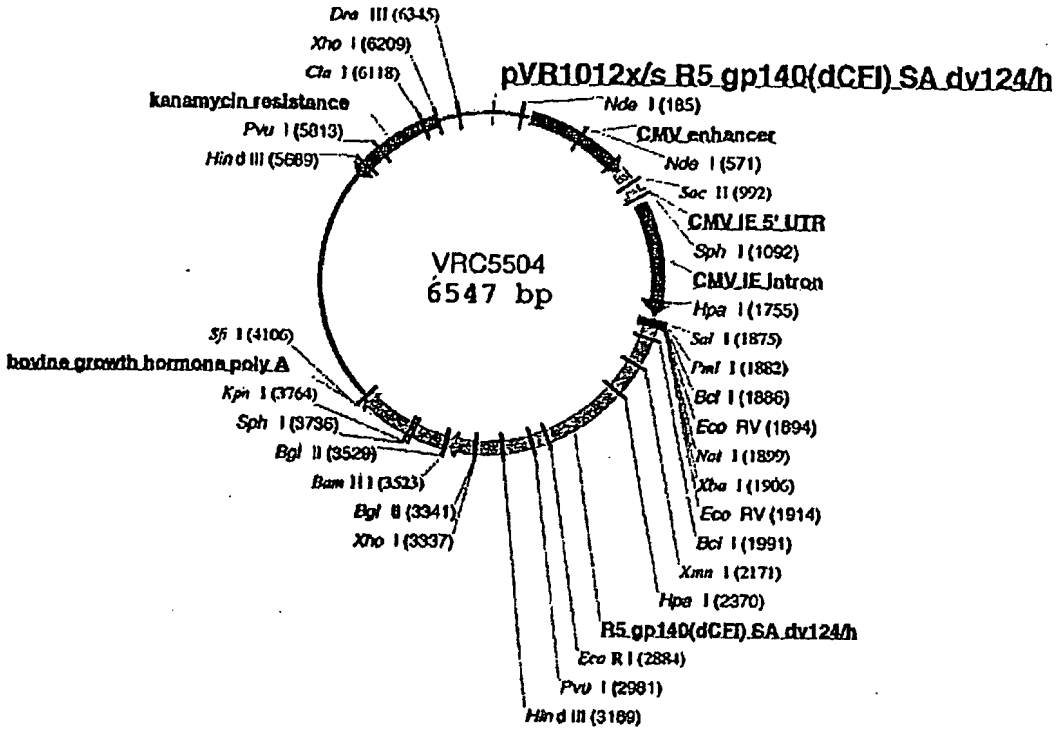

pVR1012x/s R5 gp140(dCFI) SA dv124/h
VRC5504
6547 bp
Dra III (6345)
Xho I (6209)
Cla I (6118)
kanamycin resistance
Pvu I (5813)
Hind III (5689)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2370)
R5 gp140(dCFI) SA dv124/h
Eco R I (2884)
Pvu I (2981)
Hind III (3189)
Sfi I (4106)
bovine growth hormone poly A
Kpn I (3764)
Sph I (3736)
Bgl II (3529)
Bam HI I (3523)
Bgl II (3341)
Xho I (3337)

Figure 131

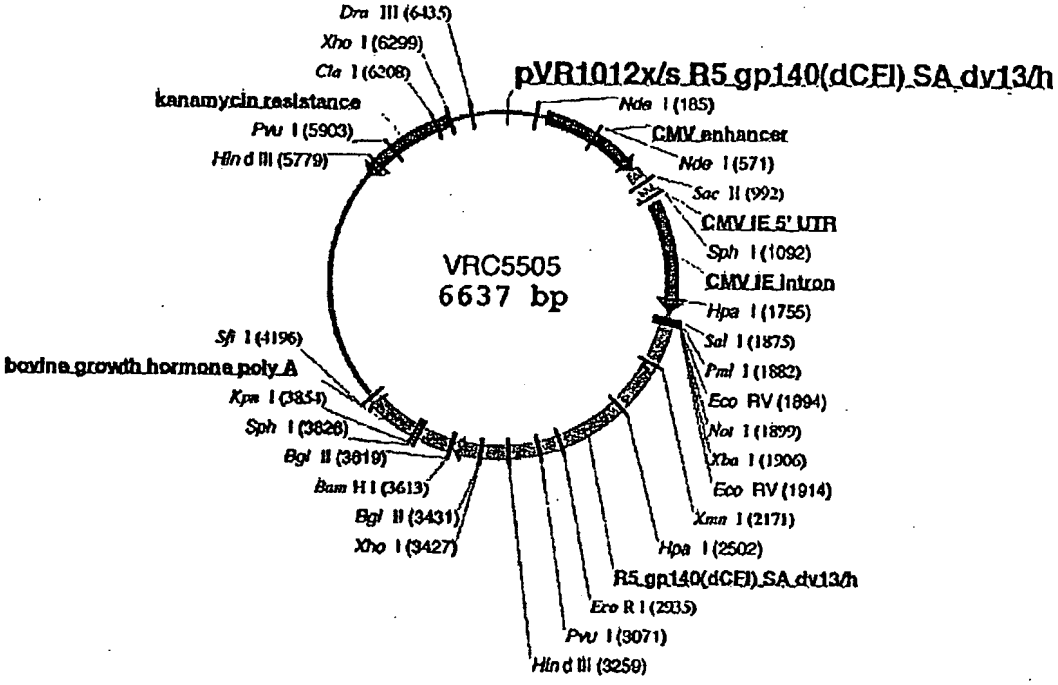

pVR1012x/s R5 gp140(dCFI) SA dv13/h
VRC5505
6637 bp
Dra III (6435)
Xho I (6299)
Cla I (6208)
kanamycin resistance
Pvu I (5903)
Hind III (5779)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2502)
R5 gp140(dCFI) SA dv13/h
Eco R I (2935)
Pvu I (3071)
Hind III (3259)
Xho I (3427)
Bgl II (3431)
Bam H I (3613)
Bgl II (3619)
Sph I (3826)
Kpn I (3854)
Sfi I (4196)
bovine growth hormone poly A

Figure 132

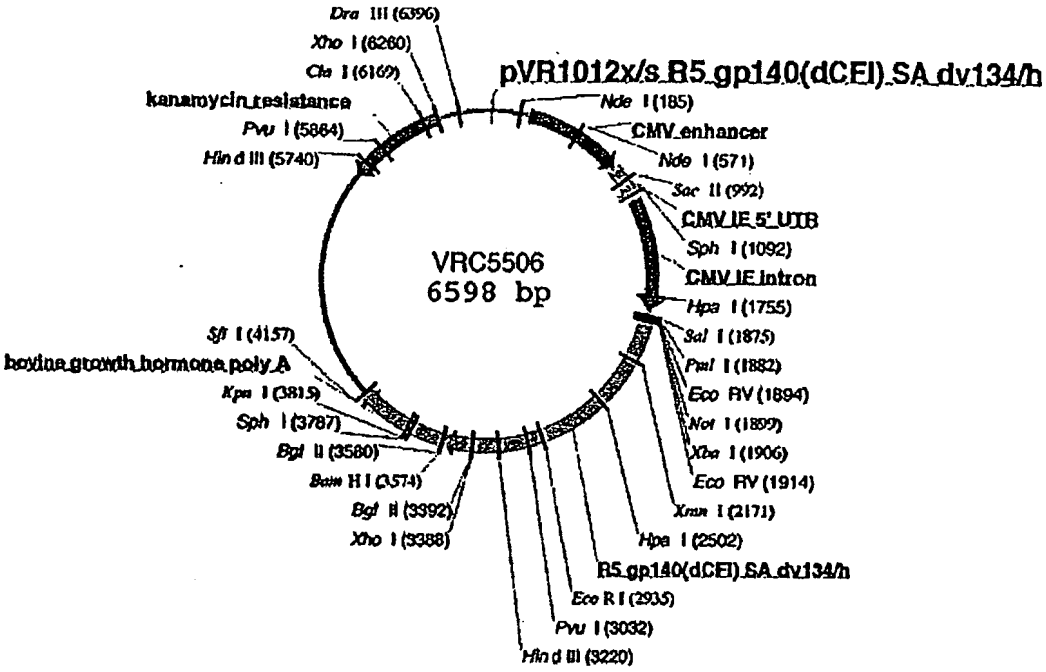

pVR1012x/s R5 gp140(dCFI) SA dv134/h
VRC5506
6598 bp
Dra III (6396)
Xho I (6260)
Cla I (6169)
kanamycin resistance
Pvu I (5864)
Hind III (5740)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pst I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2502)
R5 gp140(dCFI) SA dv134/h
Eco R I (2935)
Pvu I (3032)
Hind III (3220)
Sfi I (4157)
bovine growth hormone poly A
Kpn I (3815)
Sph I (3787)
Bgl II (3580)
Bam H I (3574)
Bgl II (3392)
Xho I (3388)

Figure 133

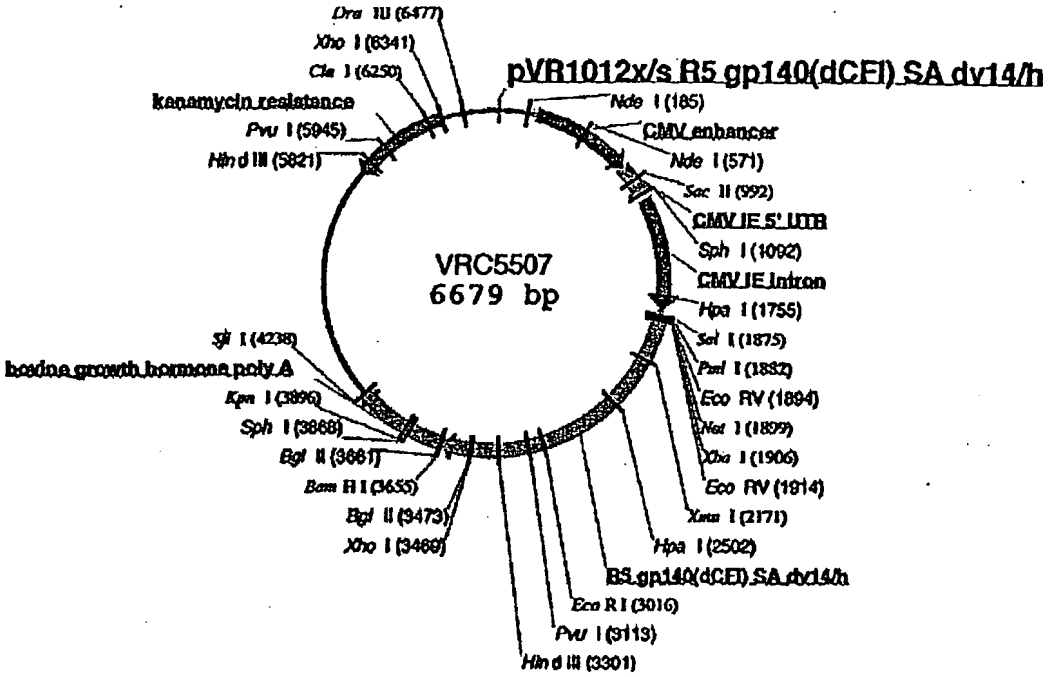

pVR1012x/s R5 gp140(dCFI) SA dv14/h
VRC5507
6679 bp
Dra III (6477)
Xho I (6341)
Cla I (6250)
kanamycin resistance
Pvu I (5945)
Hind III (5821)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Nhe I (1899)
Xba I (1906)
Eco RV (1914)
Xma I (2171)
Hpa I (2502)
R5 gp140(dCFI) SA dv14/h
Eco R I (3016)
Pvu I (3113)
Hind III (3301)
Xho I (3469)
Bgl II (3473)
Bam H I (3655)
Bgl II (3661)
Sph I (3868)
Kpn I (3896)
bovine growth hormone poly A
Sfi I (4238)

Figure 134

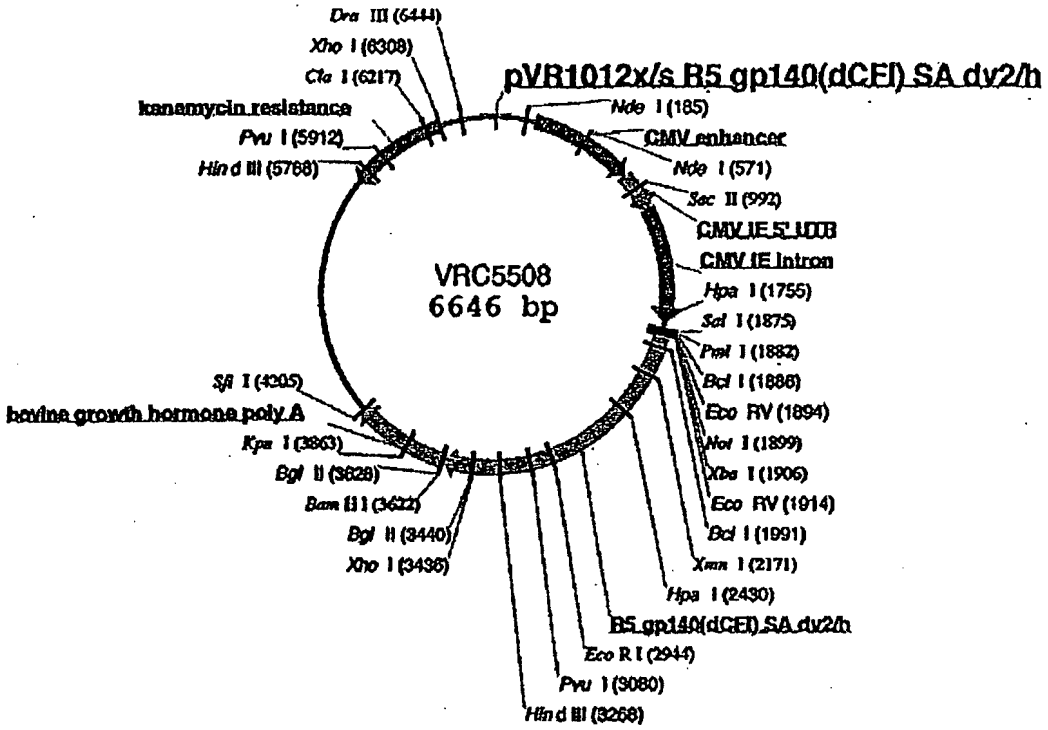

pVR1012x/s B5 gp140(dCFI) SA dv2/h
VRC5508
6646 bp
Dra III (6444)
Xho I (6308)
Cla I (6217)
kanamycin resistance
Pvu I (5912)
Hind III (5768)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2430)
B5 gp140(dCFI) SA dv2/h
Eco R I (2944)
Pvu I (3080)
Hind III (3268)
Sfi I (4205)
bovine growth hormone poly A
Kpn I (3863)
Bgl II (3628)
Bam HI (3622)
Bgl II (3440)
Xho I (3436)

Figure 135

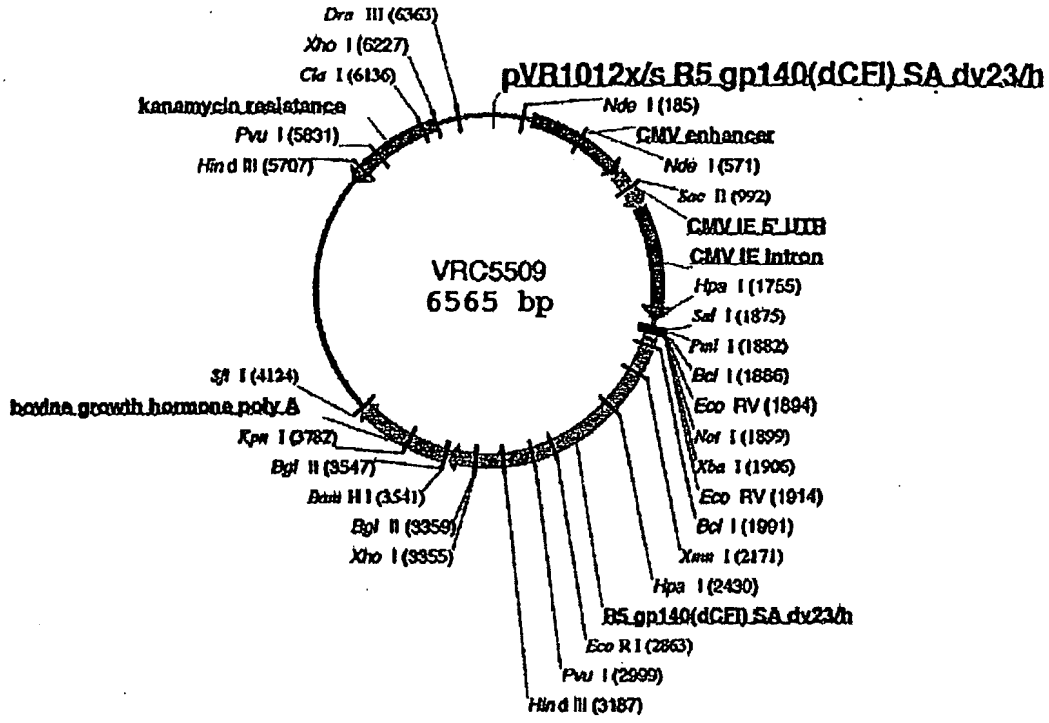

pVR1012x/s B5 gp140(dCFI) SA dv23/h
VRC5509
6565 bp
Dra III (6363)
Xho I (6227)
Cla I (6136)
kanamycin resistance
Pvu I (5831)
Hind III (5707)
Sfi I (4124)
bovine growth hormone poly A
Kpn I (3782)
Bgl II (3547)
BamH I (3541)
Bgl II (3359)
Xho I (3355)
Hind III (3187)
Pvu I (2999)
Eco R I (2863)
B5 gp140(dCFI) SA dv23/h
Hpa I (2430)
Xmn I (2171)
Bcl I (1991)
Eco RV (1914)
Xba I (1906)
Not I (1899)
Eco RV (1894)
Bcl I (1886)
Pml I (1882)
Sal I (1875)
Hpa I (1755)
CMV IE Intron
CMV IE 5' UTR
Sac II (992)
Nde I (571)
CMV enhancer
Nde I (185)

Figure 136

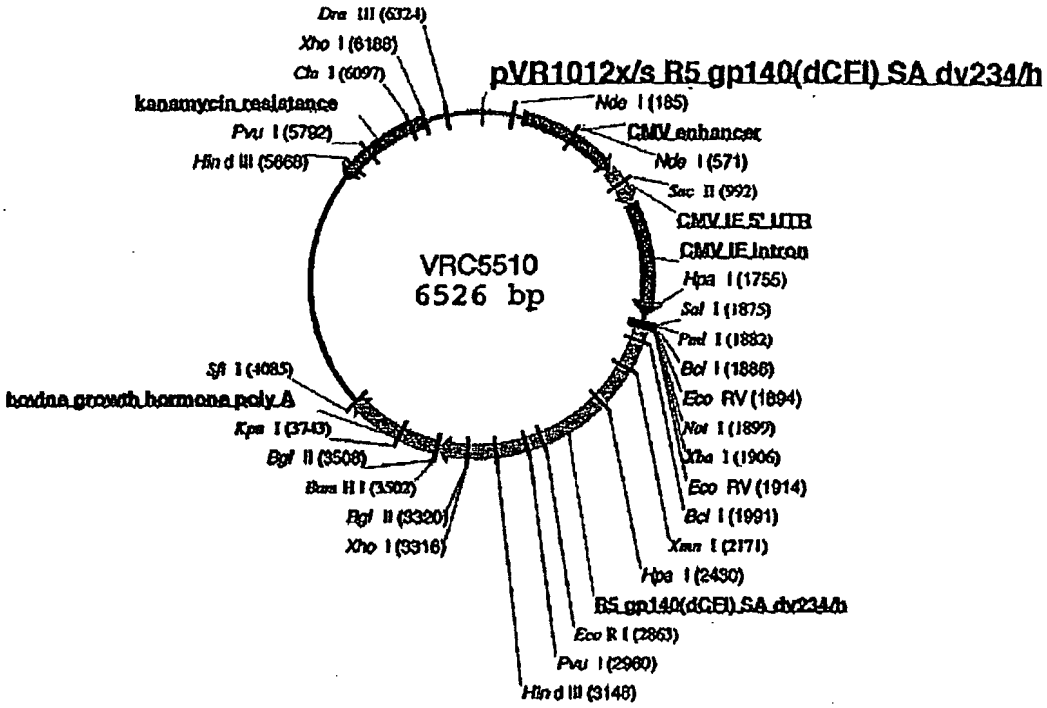

pVR1012x/s R5 gp140(dCFI) SA dv234/h
VRC5510
6526 bp
Dra III (6324)
Xho I (6188)
Cla I (6097)
kanamycin resistance
Pvu I (5792)
Hin d III (5668)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1888)
Eco RV (1894)
Not I (1897)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2430)
R5 gp140(dCFI) SA dv234/h
Eco R I (2863)
Pvu I (2960)
Hin d III (3148)
Sfi I (4085)
bovine growth hormone poly A
Kpn I (3743)
Bgl II (3508)
Bam H I (3502)
Bgl II (3320)
Xho I (3316)

Figure 137

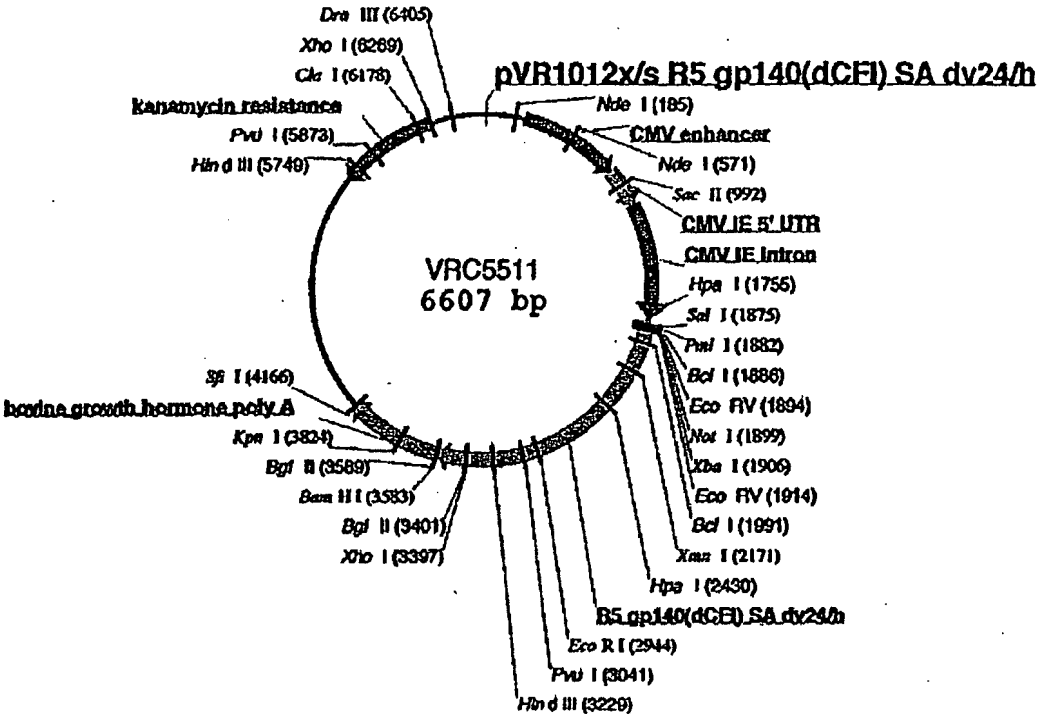

pVR1012x/s R5 gp140(dCFI) SA dv24/h
VRC5511
6607 bp
Dra III (6405)
Xho I (6269)
Cla I (6178)
kanamycin resistance
Pvu I (5873)
Hind III (5749)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2430)
R5 gp140(dCFI) SA dv24/h
Eco R I (2944)
Pvu I (3041)
Hind III (3229)
Sfi I (4166)
bovine growth hormone poly A
Kpn I (3824)
Bgl II (3589)
Bam HI (3583)
Bgl II (3401)
Xho I (3397)

Figure 138

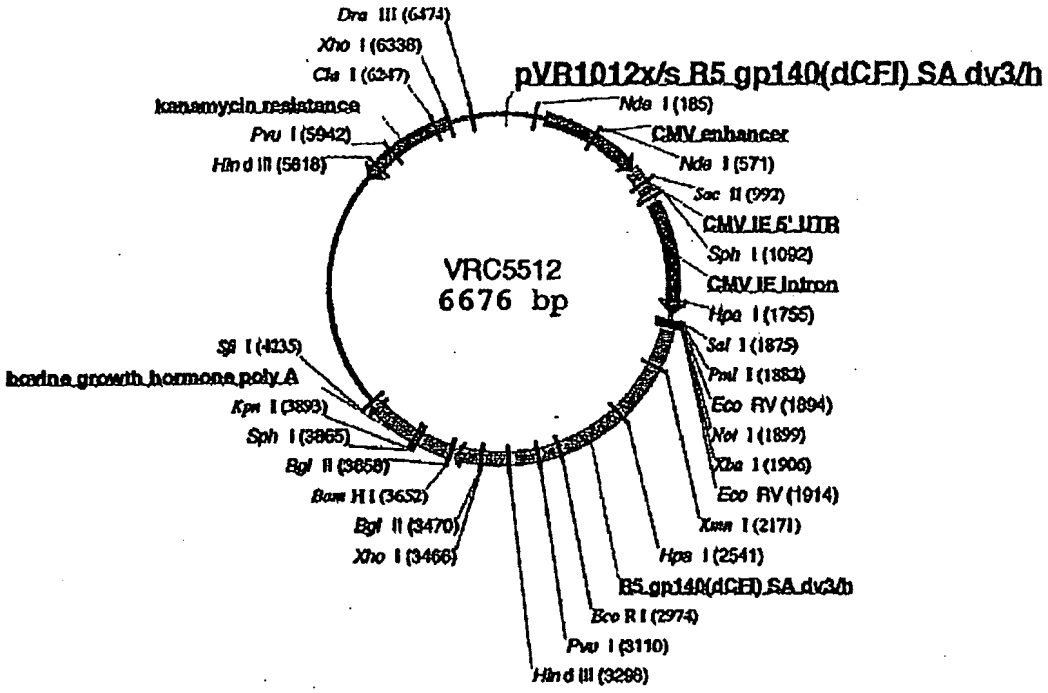

pVR1012x/s R5 gp140(dCFI) SA dv3/h
VRC5512
6676 bp
Dra III (6474)
Xho I (6338)
Cla I (6247)
kanamycin resistance
Pvu I (5942)
Hind III (5818)
Sfi I (4235)
bovine growth hormone poly A
Kpn I (3893)
Sph I (3865)
Bgl II (3858)
Bam H I (3652)
Bgl II (3470)
Xho I (3466)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2541)
R5 gp140(dCFI) SA dv3/h
Eco R I (2974)
Pvu I (3110)
Hind III (3298)

Figure 139

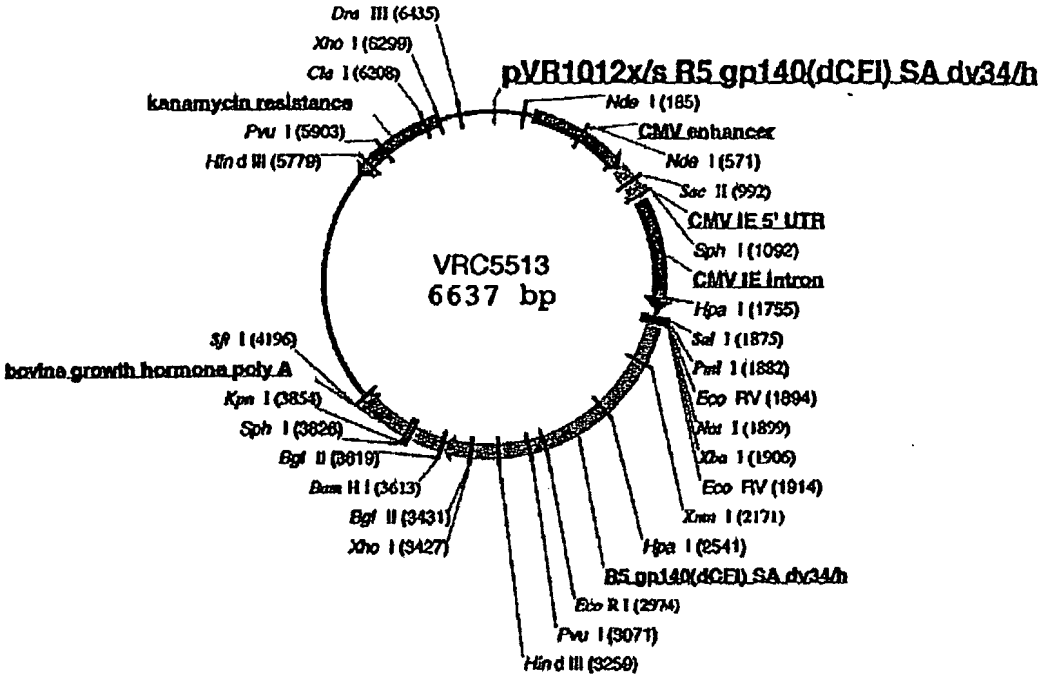

pVR1012x/s R5 gp140(dCFI) SA dv34/h
VRC5513
6637 bp
Dra III (6435)
Xho I (6299)
Cla I (6208)
kanamycin resistance
Pvu I (5903)
Hind III (5779)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Nsi I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2541)
R5 gp140(dCFI) SA dv34/h
Eco R I (2974)
Pvu I (3071)
Hind III (3259)
Sfi I (4196)
bovine growth hormone poly A
Kpn I (3854)
Sph I (3826)
Bgl II (3819)
Bam H I (3613)
Bgl II (3431)
Xho I (3427)

Figure 140

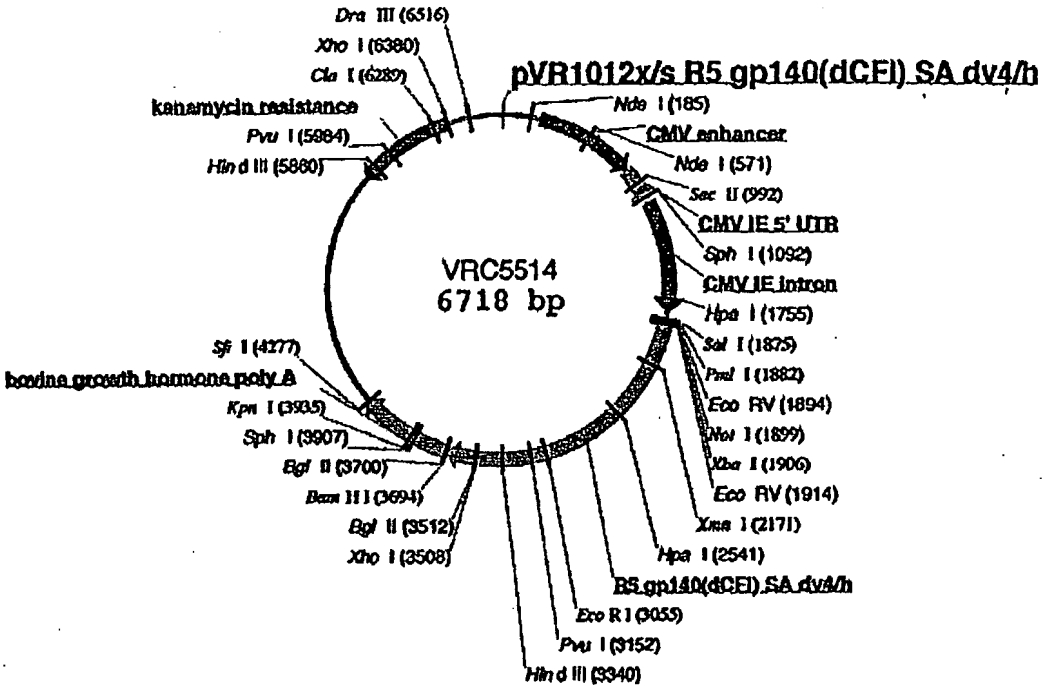

pVR1012x/s R5 gp140(dCFI) SA dv4/h
VRC5514
6718 bp
Dra III (6516)
Xho I (6380)
Cla I (6289)
kanamycin resistance
Pvu I (5984)
Hind III (5860)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xma I (2171)
Hpa I (2541)
R5 gp140(dCFI) SA dv4/h
Eco R I (3055)
Pvu I (3152)
Hind III (3340)
Sfi I (4277)
bovine growth hormone poly A
Kpn I (3935)
Sph I (3907)
Bgl II (3700)
Bam HI (3694)
Bgl II (3512)
Xho I (3508)

Figure 141

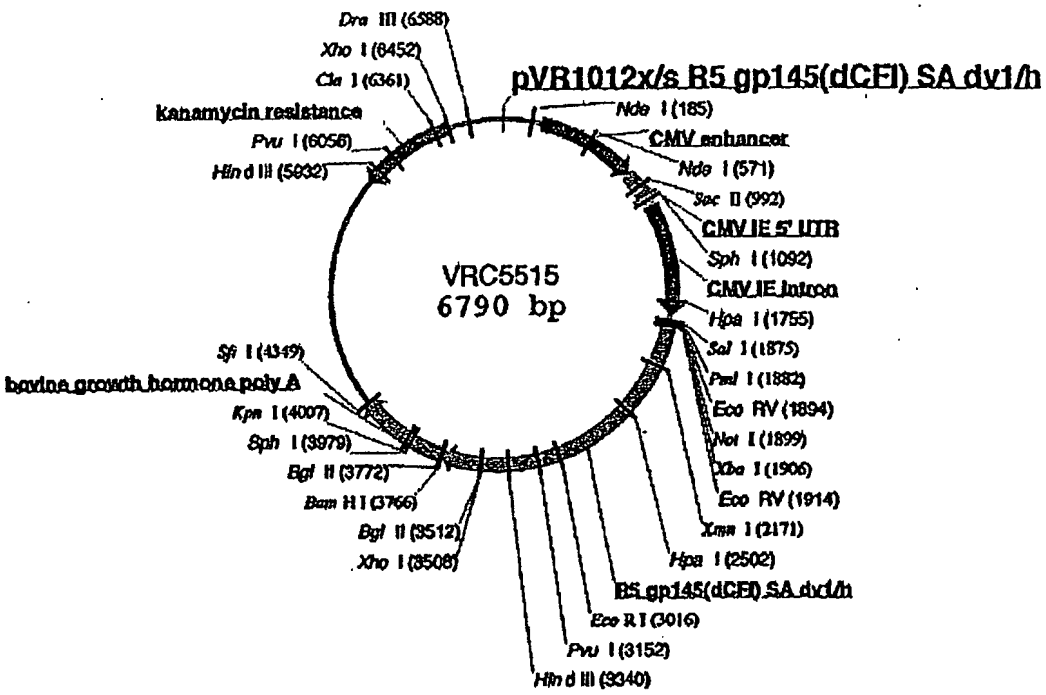

pVR1012x/s B5 gp145(dCFI) SA dv1/h
VRC5515
6790 bp
Dra III (6588)
Xho I (6452)
Cla I (6361)
kanamycin resistance
Pvu I (6056)
Hind III (5832)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xma I (2171)
Hpa I (2502)
B5 gp145(dCFI) SA dv1/h
Eco R I (3016)
Pvu I (3152)
Hind III (3340)
Sfi I (4349)
bovine growth hormone poly A
Kpn I (4007)
Sph I (3979)
Bgl II (3772)
Bam H I (3766)
Bgl II (3512)
Xho I (3508)

Figure 142

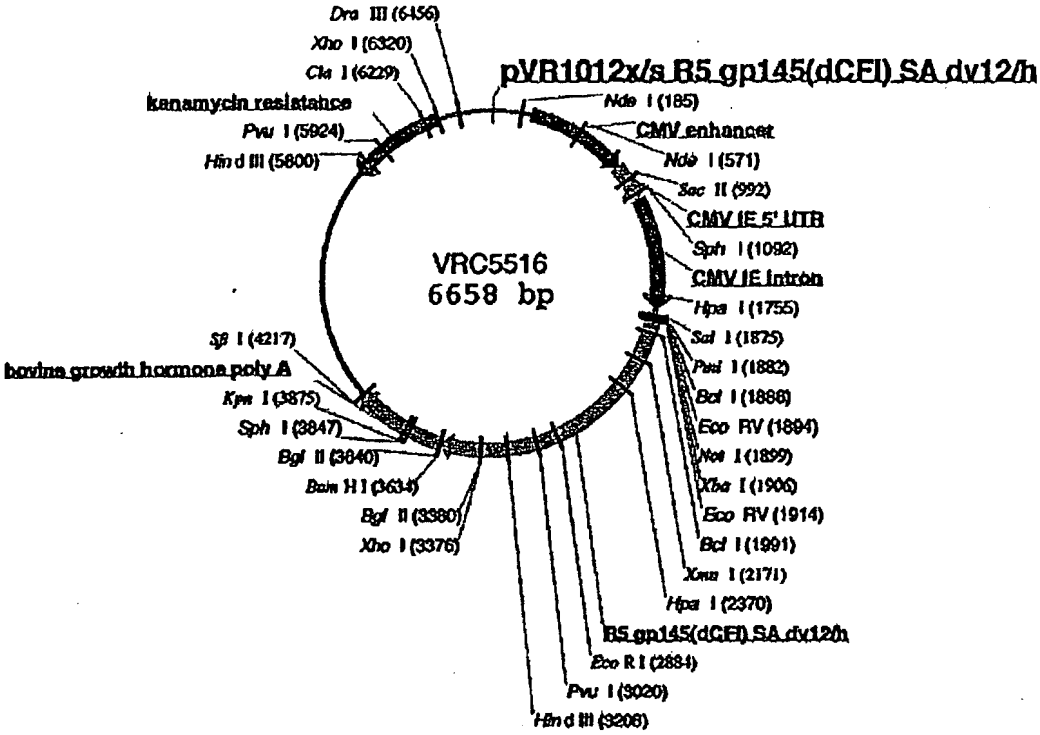

pVR1012x/s R5 gp145(dCFI) SA dv12/h
VRC5516
6658 bp
Dra III (6456)
Xho I (6320)
Cla I (6229)
kanamycin resistance
Pvu I (5924)
Hind III (5800)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pst I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2370)
R5 gp145(dCFI) SA dv12/h
Eco R I (2884)
Pvu I (3020)
Hind III (3206)
Sal I (4217)
bovine growth hormone poly A
Kpn I (3875)
Sph I (3847)
Bgl II (3840)
Bam H I (3634)
Bgl II (3380)
Xho I (3376)

Figure 143

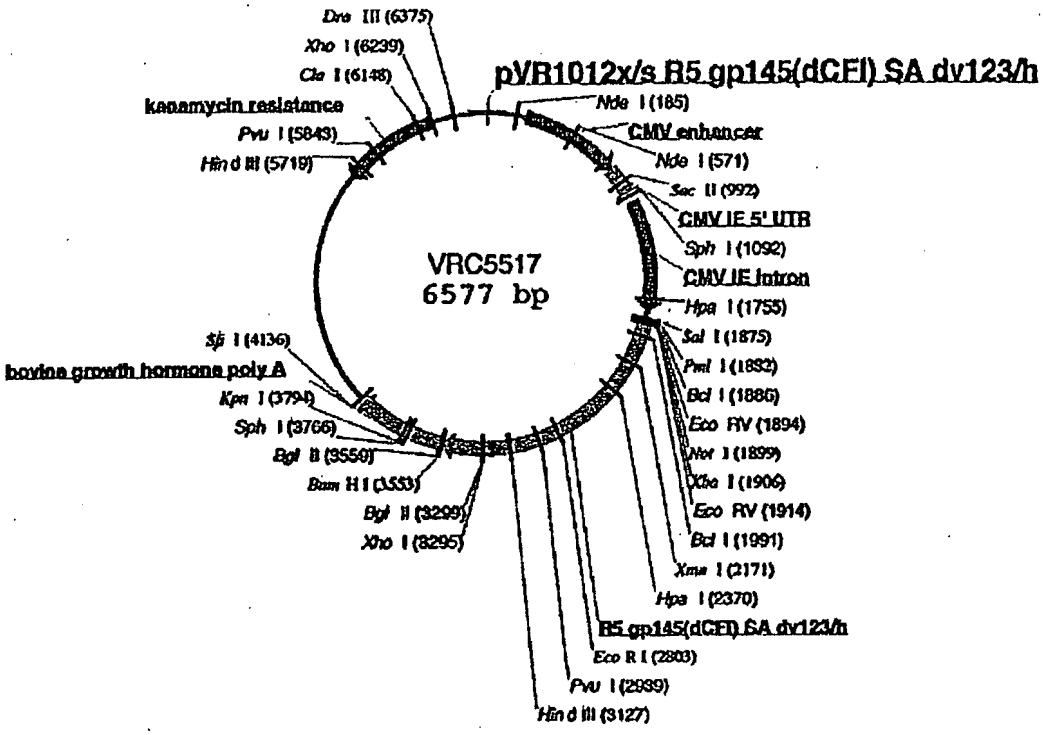

pVR1012x/s R5 gp145(dCFI) SA dv123/h
VRC5517
6577 bp
Dra III (6375)
Xho I (6239)
Cla I (6148)
kanamycin resistance
Pvu I (5843)
Hind III (5719)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xma I (2171)
Hpa I (2370)
R5 gp145(dCFI) SA dv123/h
Eco R I (2803)
Pvu I (2939)
Hind III (3127)
Sfi I (4136)
bovine growth hormone poly A
Kpn I (3794)
Sph I (3766)
Bgl II (3550)
Bam H I (3553)
Bgl II (3299)
Xho I (3295)

Figure 144

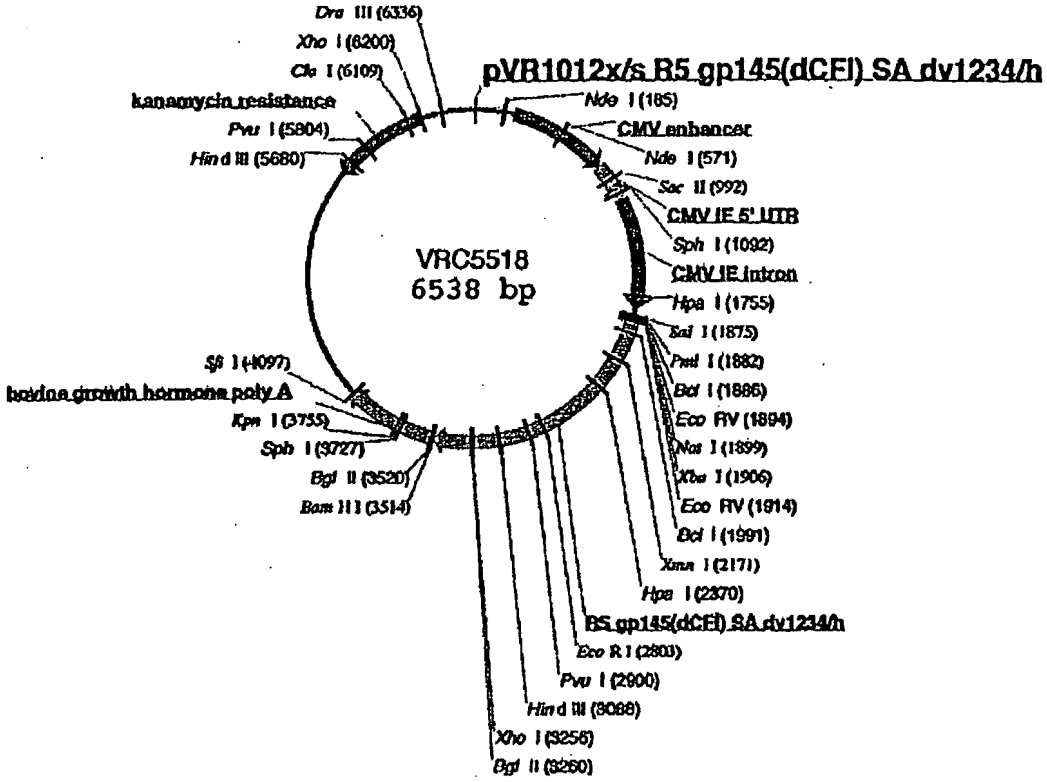

pVR1012x/s R5 gp145(dCFI) SA dv1234/h
VRC5518
6538 bp
Dra III (6336)
Xho I (6200)
Cla I (6109)
kanamycin resistance
Pvu I (5804)
Hind III (5680)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pst I (1882)
Bcl I (1886)
Eco RV (1894)
Nsi I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2370)
R5 gp145(dCFI) SA dv1234/h
Eco R I (2803)
Pvu I (2900)
Hind III (3068)
Xho I (3256)
Bgl II (3260)
Sfi I (4097)
bovine growth hormone poly A
Kpn I (3755)
Sph I (3727)
Bgl II (3520)
Bam HI (3514)

Figure 145

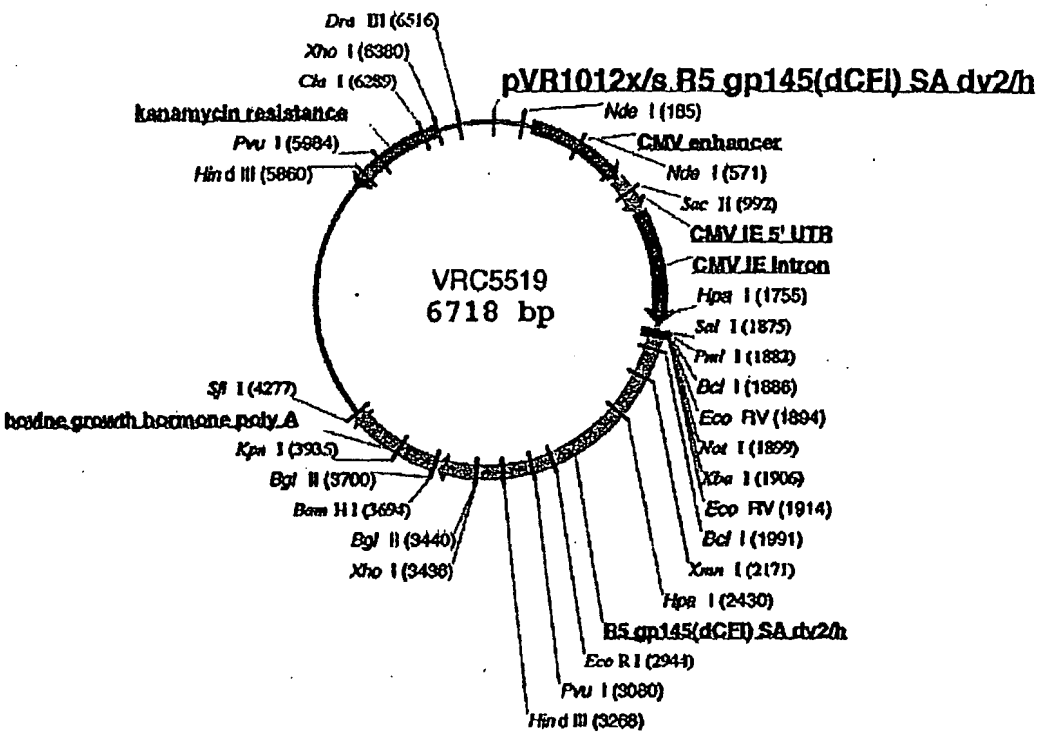

pVR1012x/s B5 gp145(dCFI) SA dv2/h
VRC5519
6718 bp
Dra III (6516)
Xho I (6380)
Cla I (6289)
kanamycin resistance
Pvu I (5984)
Hind III (5860)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2430)
B5 gp145(dCFI) SA dv2/h
Eco R I (2944)
Pvu I (3080)
Hind III (3268)
Sfi I (4277)
bovine growth hormone poly A
Kpn I (3935)
Bgl II (3700)
Bam H I (3694)
Bgl II (3440)
Xho I (3436)

Figure 146

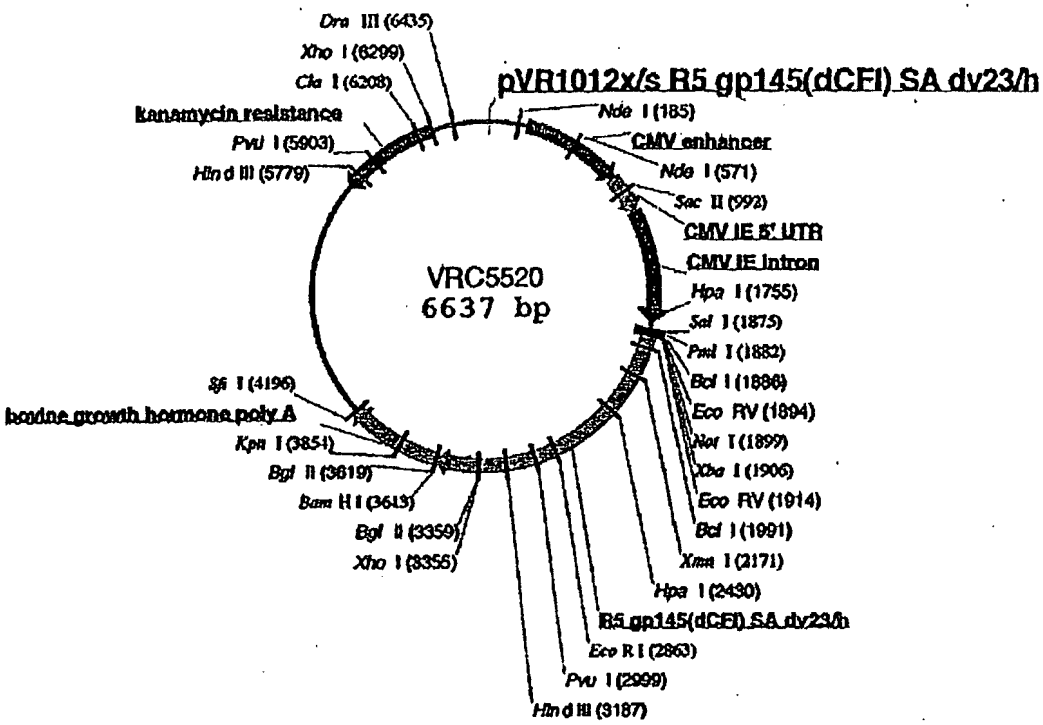

pVR1012x/s R5 gp145(dCFI) SA dv23/h
VRC5520
6637 bp
Dra III (6435)
Xho I (6299)
Cla I (6208)
kanamycin realstance
Pvu I (5903)
Hind III (5779)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1898)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xma I (2171)
Hpa I (2430)
R5 gp145(dCFI) SA dv23/h
Eco R I (2863)
Pvu I (2999)
Hind III (3187)
Sfi I (4196)
bovine growth hormone poly A
Kpn I (3851)
Bgl II (3619)
Bam H I (3613)
Bgl II (3359)
Xho I (3356)

Figure 147

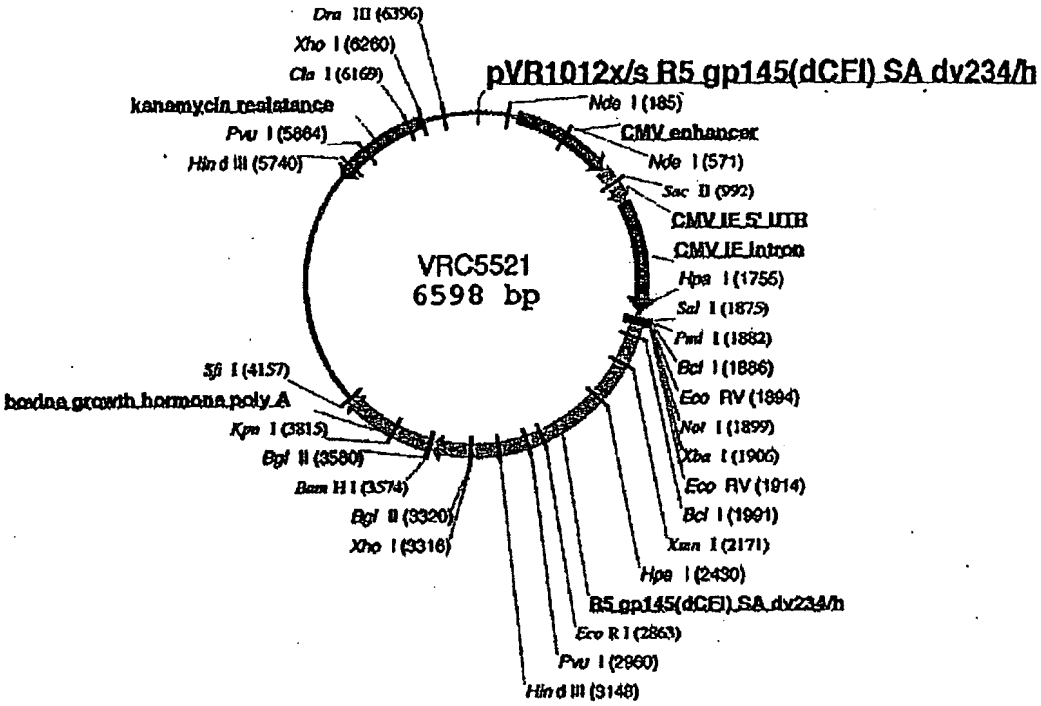

pVR1012x/s R5 gp145(dCFI) SA dv234/h
VRC5521
6598 bp
Dra III (6396)
Xho I (6260)
Cla I (6169)
kanamycin resistance
Pvu I (5884)
Hind III (5740)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2430)
R5 gp145(dCFI) SA dv234/h
Eco R I (2863)
Pvu I (2960)
Hind III (3148)
Sfi I (4157)
bovine growth hormone poly A
Kpn I (3815)
Bgl II (3580)
Bam H I (3574)
Bgl II (3320)
Xho I (3316)

Figure 148

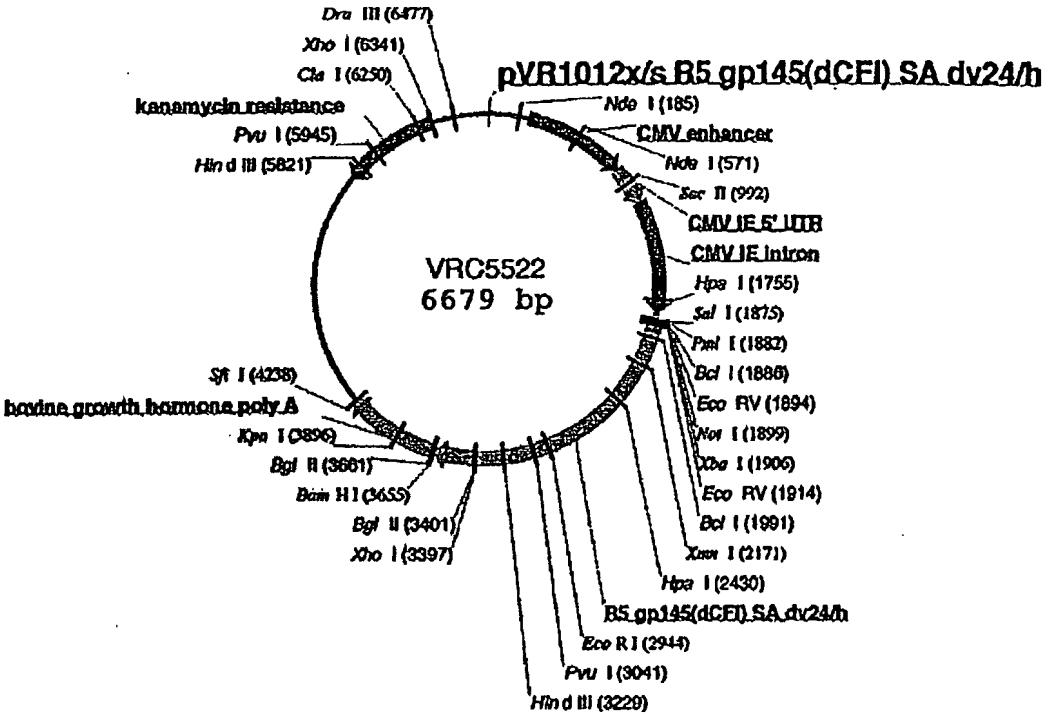

pVR1012x/s B5 gp145(dCFI) SA dv24/h
VRC5522
6679 bp
Dra III (6477)
Xho I (6341)
Cla I (6250)
kanamycin resistance
Pvu I (5945)
Hin d III (5821)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xmn I (2171)
Hpa I (2430)
B5 gp145(dCFI) SA dv24/h
Eco R I (2944)
Pvu I (3041)
Hin d III (3229)
Sfi I (4238)
bovine growth hormone poly A
Xba I (3896)
Bgl II (3661)
Bam H I (3655)
Bgl II (3401)
Xho I (3397)

Figure 149

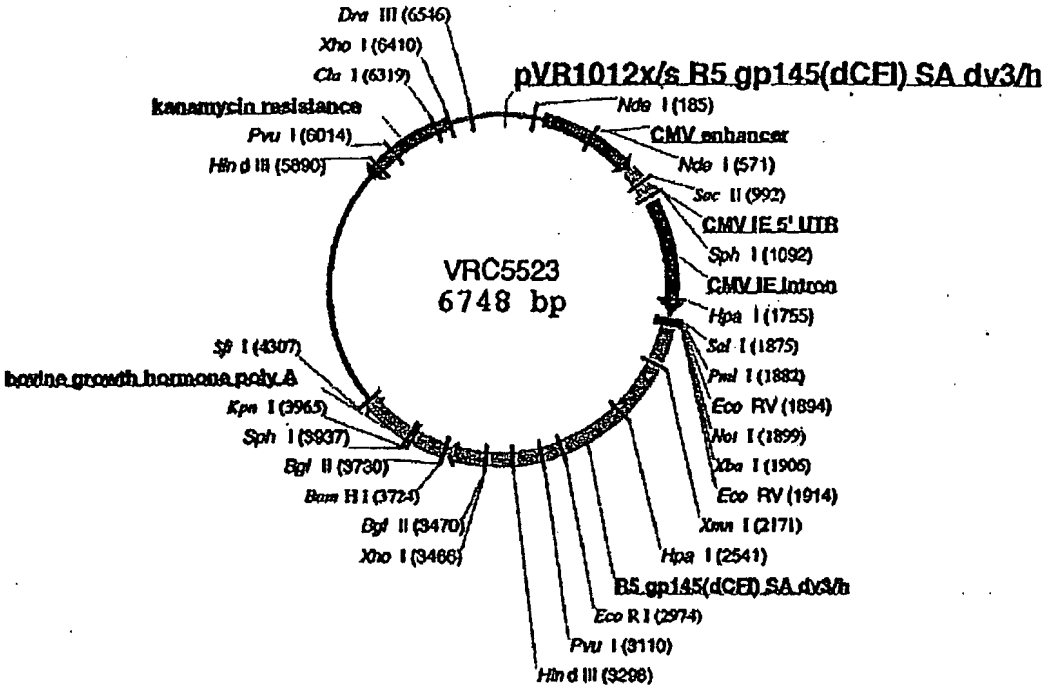

pVR1012x/s R5 gp145(dCFI) SA dv3/h
VRC5523
6748 bp
Dra III (6546)
Xho I (6410)
Cla I (6319)
kanamycin resistance
Pvu I (6014)
Hind III (5890)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2541)
R5 gp145(dCFI) SA dv3/h
Eco R I (2974)
Pvu I (3110)
Hind III (3298)
Xho I (3466)
Bgl II (3470)
Bam H I (3724)
Bgl II (3730)
Sph I (3937)
Kpn I (3965)
bovine growth hormone poly A
Sfi I (4307)

Figure 150

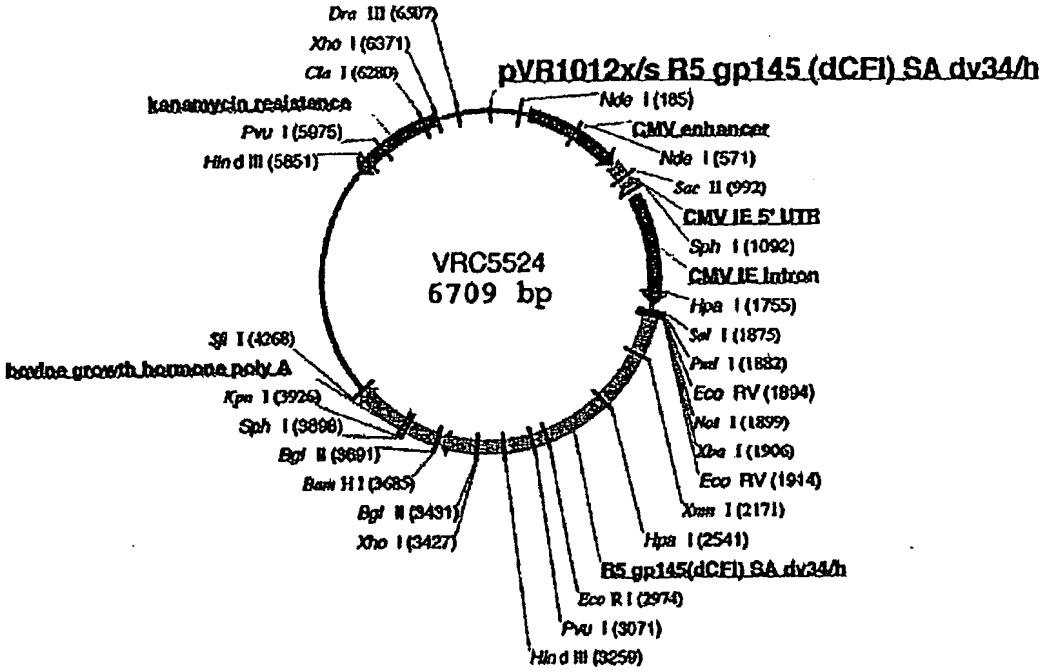

pVR1012x/s R5 gp145 (dCFI) SA dv34/h
VRC5524
6709 bp
Dra III (6507)
Xho I (6371)
Cla I (6280)
kanamycin resistance
Pvu I (5975)
Hind III (5851)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2541)
R5 gp145(dCFI) SA dv34/h
Eco R I (2974)
Pvu I (3071)
Hind III (3259)
Sil I (4268)
bovine growth hormone poly A
Kpn I (3926)
Sph I (3898)
Bgl II (3691)
Bam H I (3685)
Bgl II (3491)
Xho I (3427)

Figure 151

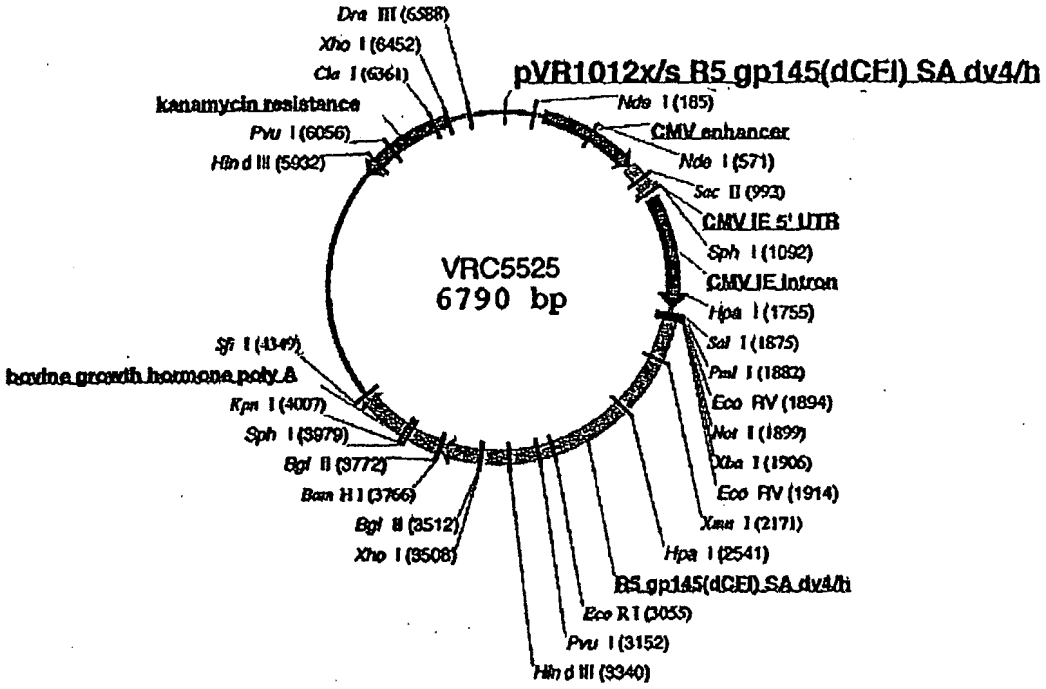

pVR1012x/s B5 gp145(dCFI) SA dv4/h
VRC5525
6790 bp
Dra III (6588)
Xho I (6452)
Cla I (6361)
kanamycin resistance
Pvu I (6056)
Hind III (5932)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (993)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2541)
B5 gp145(dCFI) SA dv4/h
Eco R I (3055)
Pvu I (3152)
Hind III (3340)
Xho I (3508)
Bgl II (3512)
Bam H I (3756)
Sph I (3979)
Kpn I (4007)
bovine growth hormone poly A
Sfi I (4349)

Figure 152

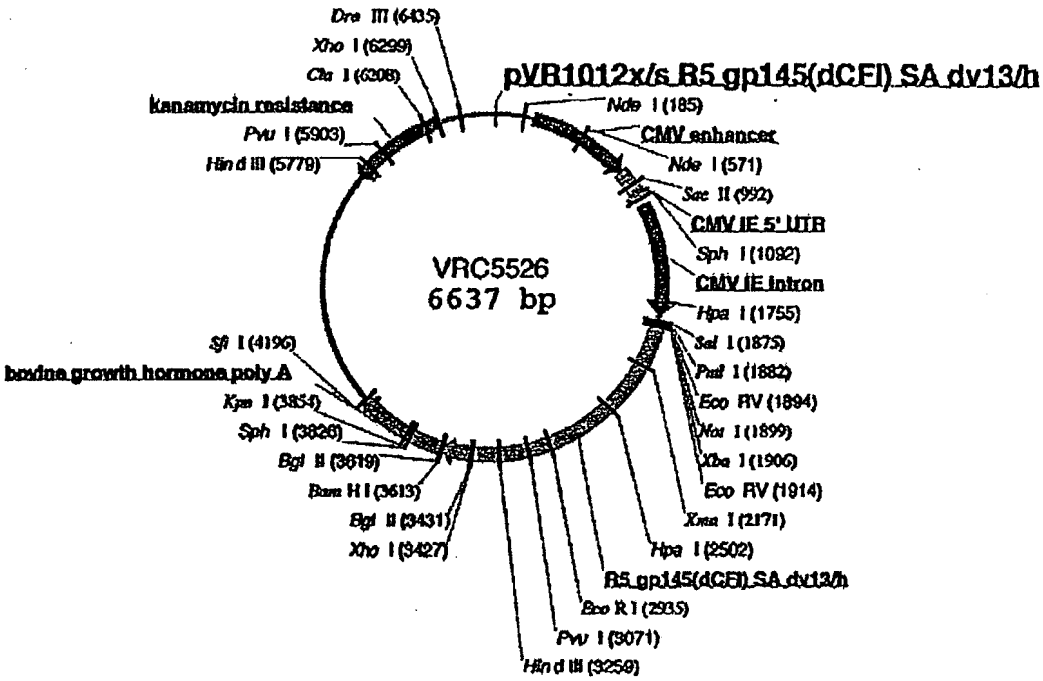

pVR1012x/s R5 gp145(dCFI) SA dv13/h
VRC5526
6637 bp
Dra III (6435)
Xho I (6299)
Cla I (6208)
kanamycin resistance
Pvu I (5903)
Hind III (5779)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pst I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xma I (2171)
Hpa I (2502)
R5 gp145(dCFI) SA dv13/h
Eco R I (2935)
Pvu I (3071)
Hind III (3259)
Sfi I (4196)
bovine growth hormone poly A
Kpn I (3854)
Sph I (3826)
Bgl II (3619)
Bam H I (3613)
Bgl II (3431)
Xho I (3427)

Figure 153

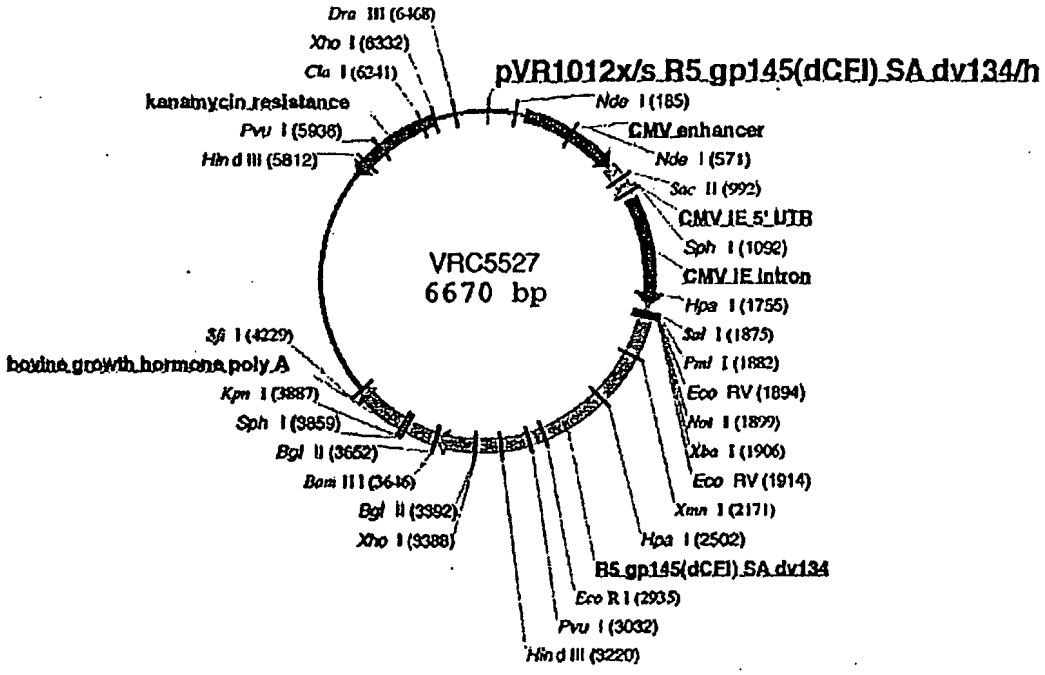

pVR1012x/s R5 gp145(dCFI) SA dv134/h
VRC5527
6670 bp
Dra III (6468)
Xho I (6332)
Cla I (6241)
kanamycin resistance
Pvu I (5936)
Hind III (5812)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2502)
R5 gp145(dCFI) SA dv134
Eco R I (2935)
Pvu I (3032)
Hind III (3220)
Sfi I (4229)
bovine growth hormone poly A
Kpn I (3887)
Sph I (3859)
Bgl II (3652)
Bam III (3646)
Bgl II (3392)
Xho I (3388)

Figure 154

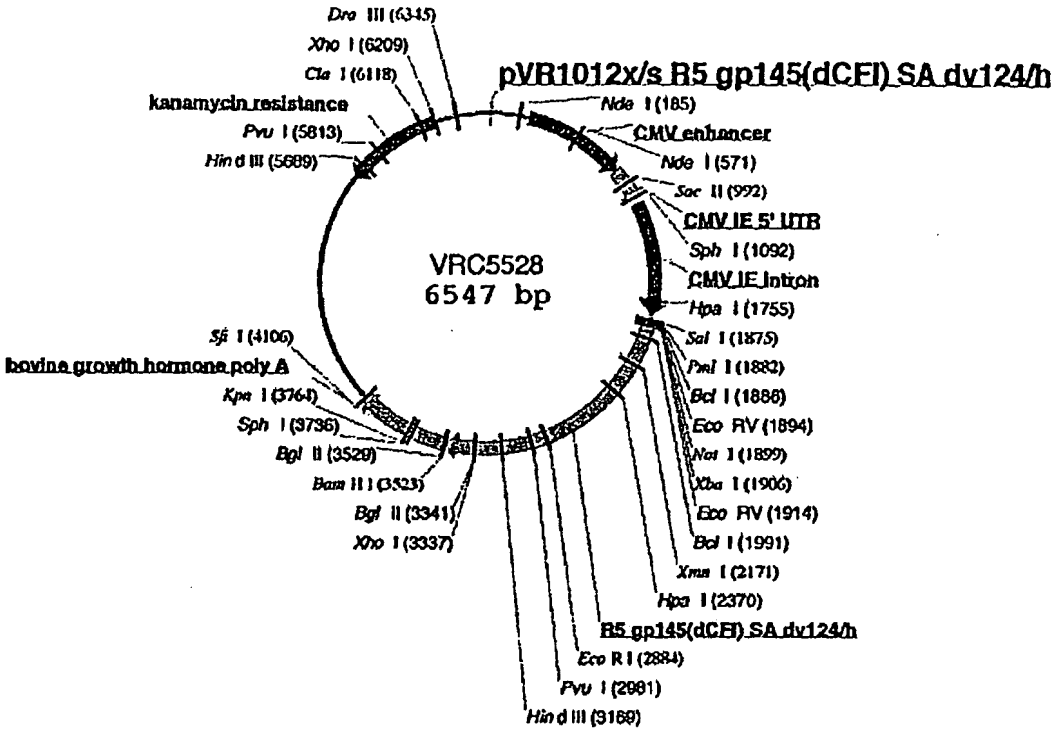

pVR1012x/s R5 gp145(dCFI) SA dv124/h
VRC5528
6547 bp
Dra III (6345)
Xho I (6209)
Cla I (6118)
kanamycin resistance
Pvu I (5813)
Hind III (5689)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Bcl I (1886)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Bcl I (1991)
Xma I (2171)
Hpa I (2370)
R5 gp145(dCFI) SA dv124/h
Eco R I (2884)
Pvu I (2981)
Hind III (3169)
Sfi I (4106)
bovine growth hormone poly A
Kpn I (3764)
Sph I (3736)
Bgl II (3529)
Bam H I (3523)
Bgl II (3341)
Xho I (3337)

Figure 155

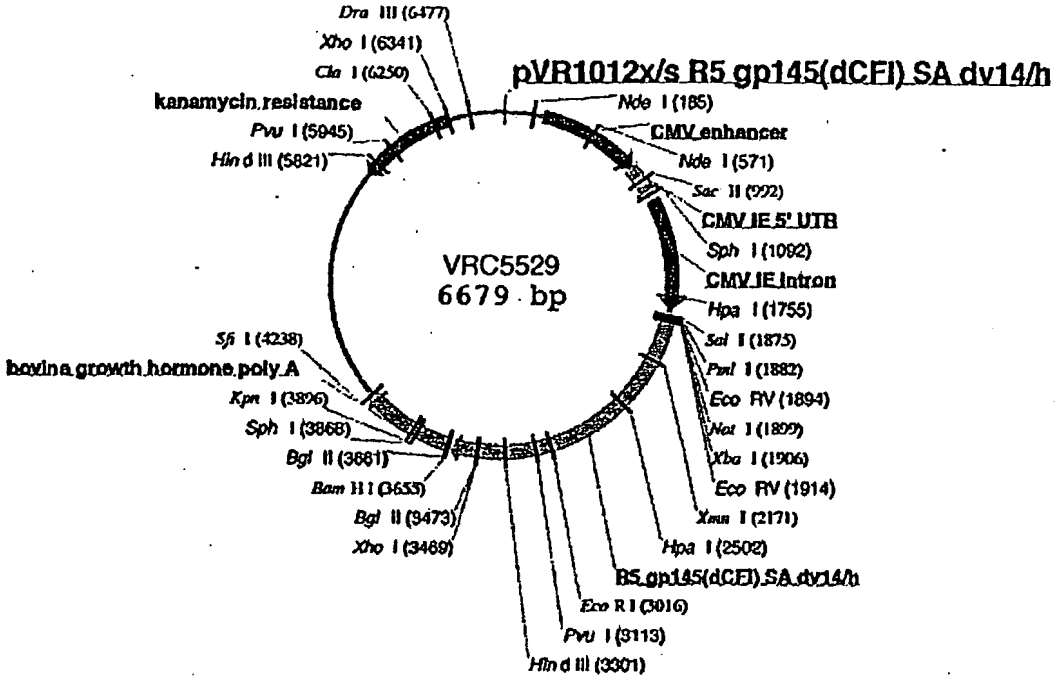

pVR1012x/s R5 gp145(dCFI) SA dv14/h
VRC5529
6679 bp
Dra III (6477)
Xho I (6341)
Cla I (6250)
kanamycin resistance
Pvu I (5945)
Hind III (5821)
Nde I (185)
CMV enhancer
Nde I (571)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1882)
Eco RV (1894)
Not I (1899)
Xba I (1906)
Eco RV (1914)
Xmn I (2171)
Hpa I (2502)
R5 gp145(dCFI) SA dv14/h
Eco R I (3016)
Pvu I (3113)
Hind III (3301)
Sfi I (4238)
bovine growth hormone poly A
Xpn I (3896)
Sph I (3868)
Bgl II (3681)
Bam H I (3655)
Bgl II (3473)
Xho I (3469)

Figure 156

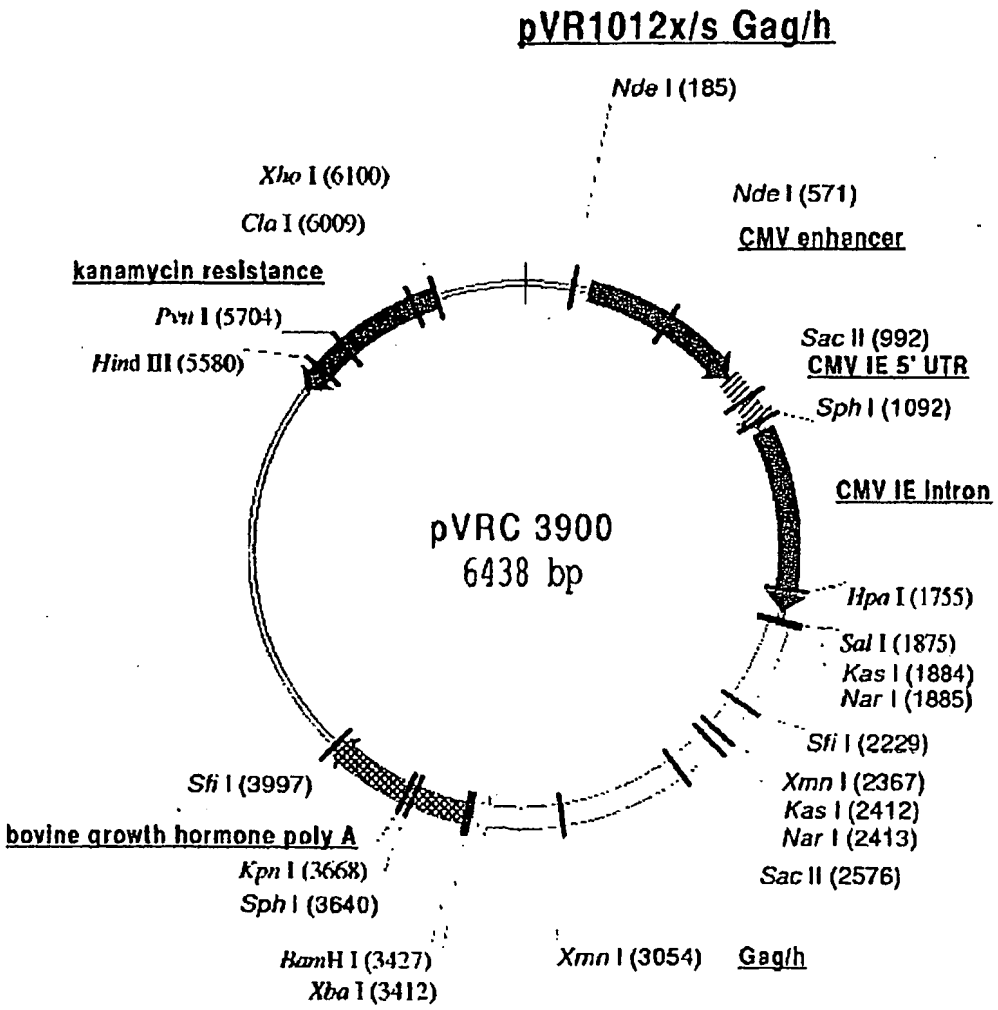

pVR1012x/s Gag/h
Nde I (185)
Xho I (6100)
Cla I (6009)
Nde I (571)
CMV enhancer
kanamycin resistance
Pvu I (5704)
Hind III (5580)
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE Intron
pVRC 3900
6438 bp
Hpa I (1755)
Sal I (1875)
Kas I (1884)
Nar I (1885)
Sfi I (2229)
Xmn I (2367)
Kas I (2412)
Nar I (2413)
Sac II (2576)
Sfi I (3997)
bovine growth hormone poly A
Kpn I (3668)
Sph I (3640)
BamH I (3427)
Xba I (3412)
Xmn I (3054)
Gag/h

Figure 157

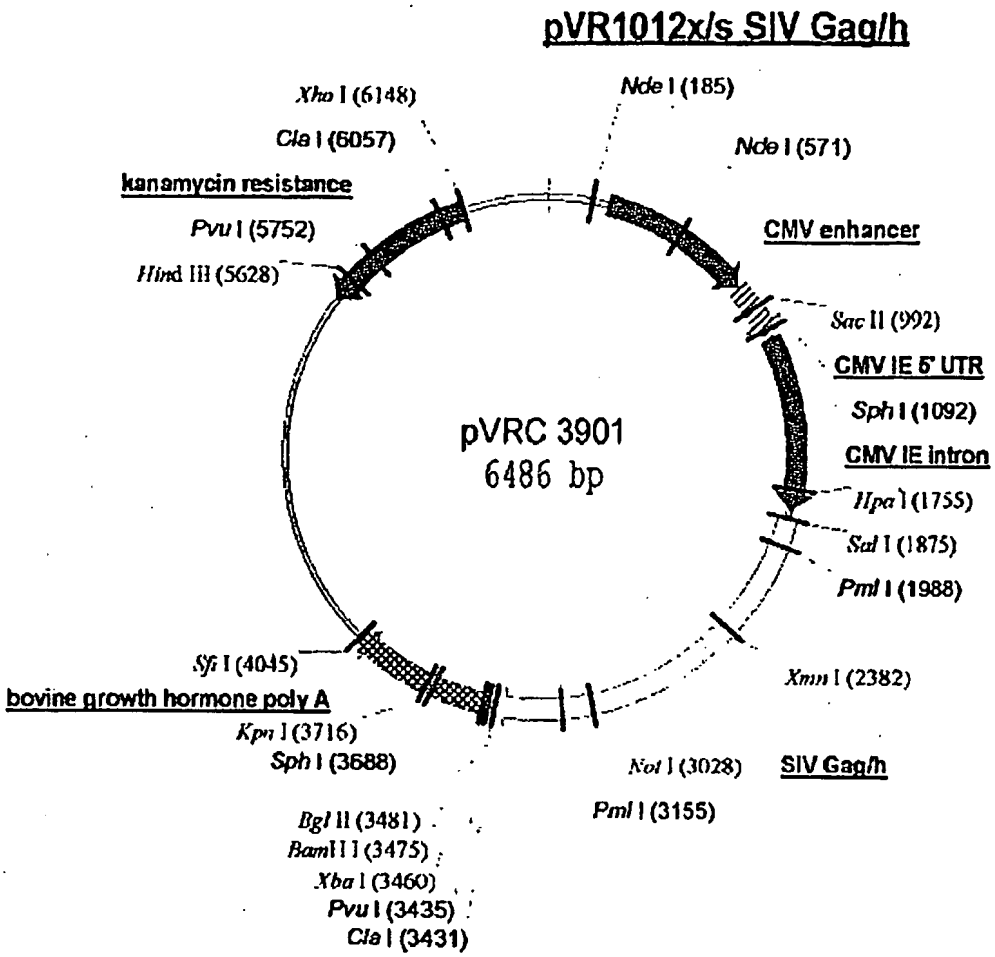

pVR1012x/s SIV Gag/h
pVRC 3901
6486 bp
Xho I (6148)
Cla I (6057)
kanamycin resistance
Pvu I (5752)
Hind III (5628)
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Pml I (1988)
Xmn I (2382)
SIV Gag/h
Not I (3028)
Pml I (3155)
Sfi I (4045)
bovine growth hormone poly A
Kpn I (3716)
Sph I (3688)
Bgl II (3481)
BamH I (3475)
Xba I (3460)
Pvu I (3435)
Cla I (3431)

Figure 158

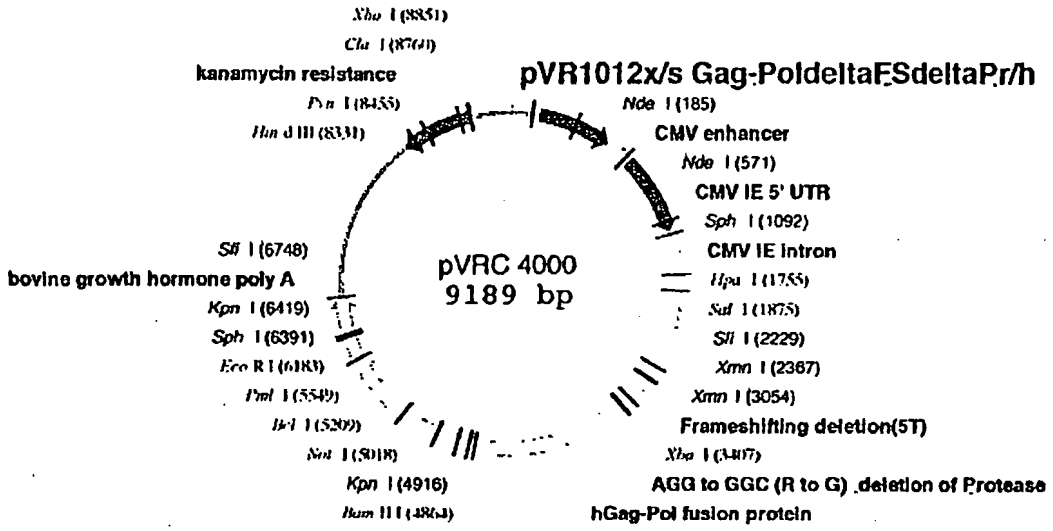

pVR1012x/s Gag-PoldeltaFSdeltaPr/h
pVRC 4000
9189 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
bovine growth hormone poly A
Frameshifting deletion(5T)
AGG to GGC (R to G) deletion of Protease
hGag-Pol fusion protein

Figure 159

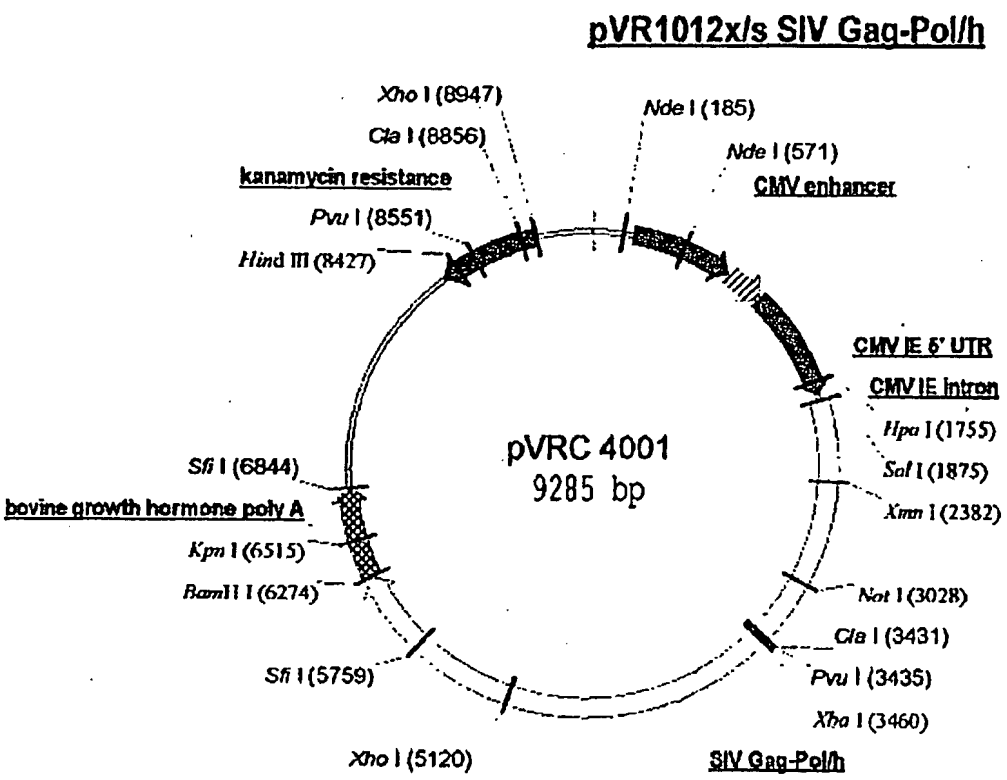

pVR1012x/s SIV Gag-Pol/h
Xho I (8947)
Cla I (8856)
kanamycin resistance
Pvu I (8551)
Hind III (8427)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Xmn I (2382)
Not I (3028)
Cla I (3431)
Pvu I (3435)
Xba I (3460)
SIV Gag-Pol/h
Xho I (5120)
Sfi I (5759)
BamH I (6274)
Kpn I (6515)
bovine growth hormone poly A
Sfi I (6844)
pVRC 4001
9285 bp

Figure 160

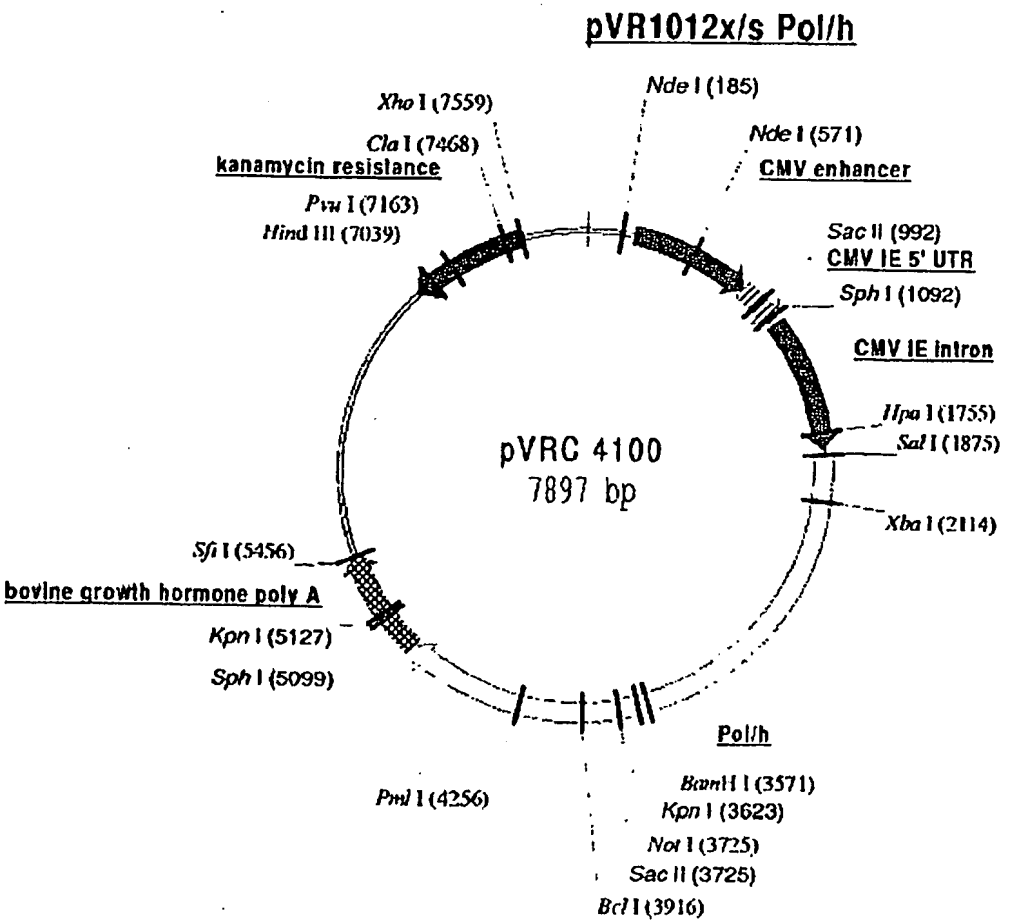

pVR1012x/s Pol/h
Xho I (7559)
Cla I (7468)
kanamycin resistance
Pvu I (7163)
Hind III (7039)
Nde I (185)
Nde I (571)
CMV enhancer
Sac II (992)
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Xba I (2114)
pVRC 4100
7897 bp
Sfi I (5456)
bovine growth hormone poly A
Kpn I (5127)
Sph I (5099)
Pml I (4256)
Pol/h
BamH I (3571)
Kpn I (3623)
Not I (3725)
Sac II (3725)
Bcl I (3916)

Figure 161

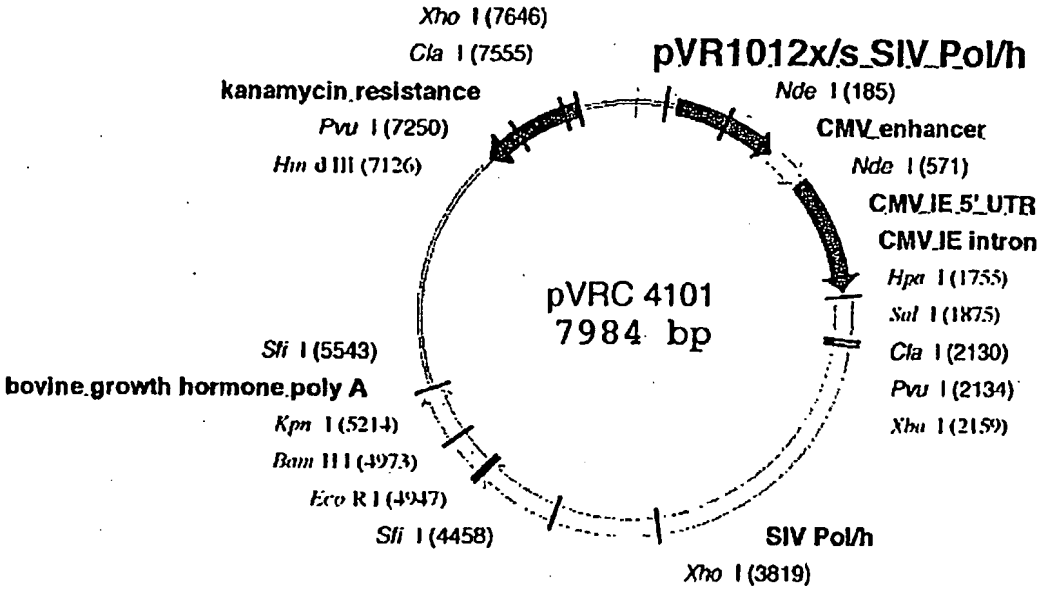

pVR1012x/s_SIV_Pol/h
pVRC 4101
7984 bp
Xho I (7646)
Cla I (7555)
kanamycin resistance
Pvu I (7250)
Hin d III (7126)
Nde I (185)
CMV enhancer
Nde I (571)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Cla I (2130)
Pvu I (2134)
Xba I (2159)
Sli I (5543)
bovine growth hormone poly A
Kpn I (5214)
Bam III (4973)
Eco R I (4947)
Sli I (4458)
SIV Pol/h
Xho I (3819)

Figure 162

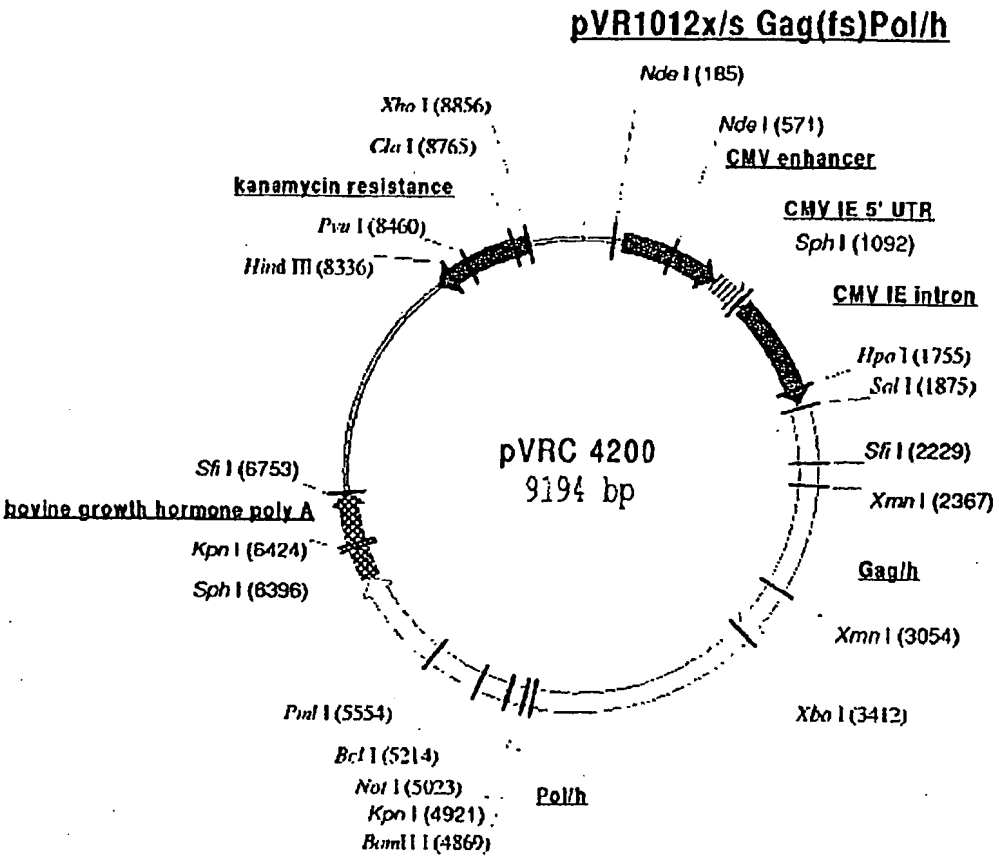

pVR1012x/s Gag(fs)Pol/h
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
Sph I (1092)
CMV IE intron
Hpa I (1755)
Sal I (1875)
Sfi I (2229)
Xmn I (2367)
Gag/h
Xmn I (3054)
Xba I (3412)
Pol/h
Kpn I (4921)
BamH I (4869)
Not I (5023)
Bcl I (5214)
Pml I (5554)
Sph I (6396)
Kpn I (6424)
bovine growth hormone poly A
Sfi I (6753)
Hind III (8336)
Pvu I (8460)
kanamycin resistance
Cla I (8765)
Xho I (8856)
pVRC 4200
9194 bp

Figure 163

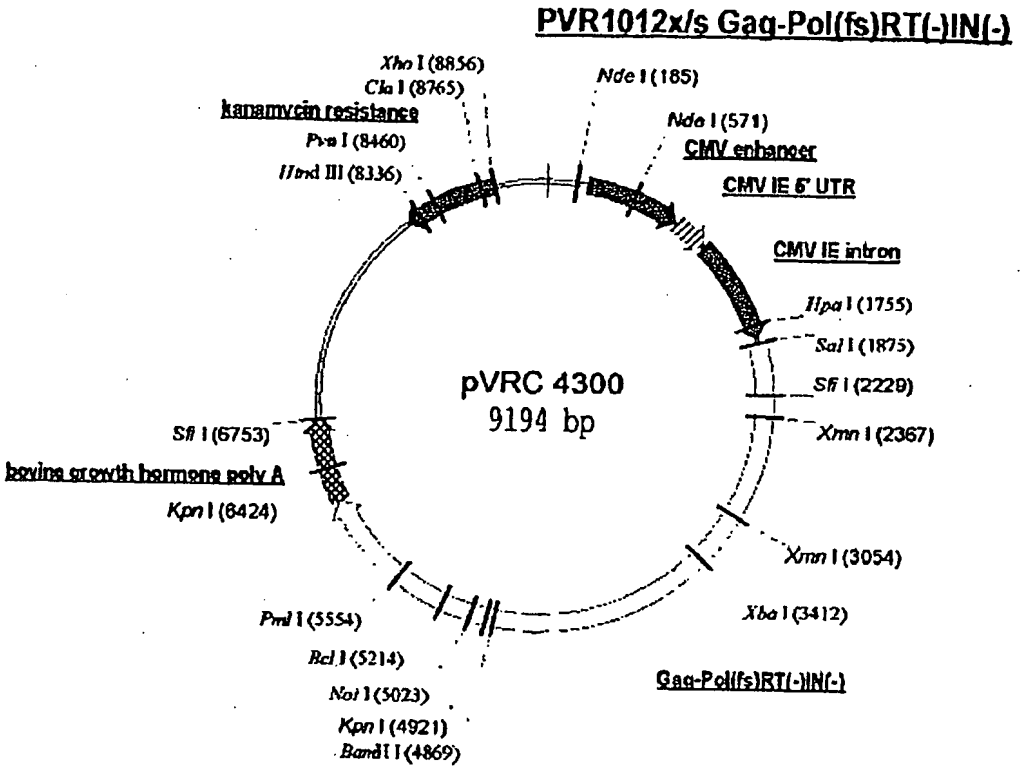

PVR1012x/s Gag-Pol(fs)RT(-)IN(-)
Xho I (8856)
Cla I (8765)
kanamycin resistance
Pvu I (8460)
Hind III (8336)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Sfi I (2229)
Xmn I (2367)
pVRC 4300
9194 bp
Sfi I (6753)
bovine growth hormone poly A
Kpn I (8424)
Xmn I (3054)
Xba I (3412)
Pml I (5554)
Bcl I (5214)
Not I (5023)
Kpn I (4921)
BamH I (4869)
Gag-Pol(fs)RT(-)IN(-)

Figure 164

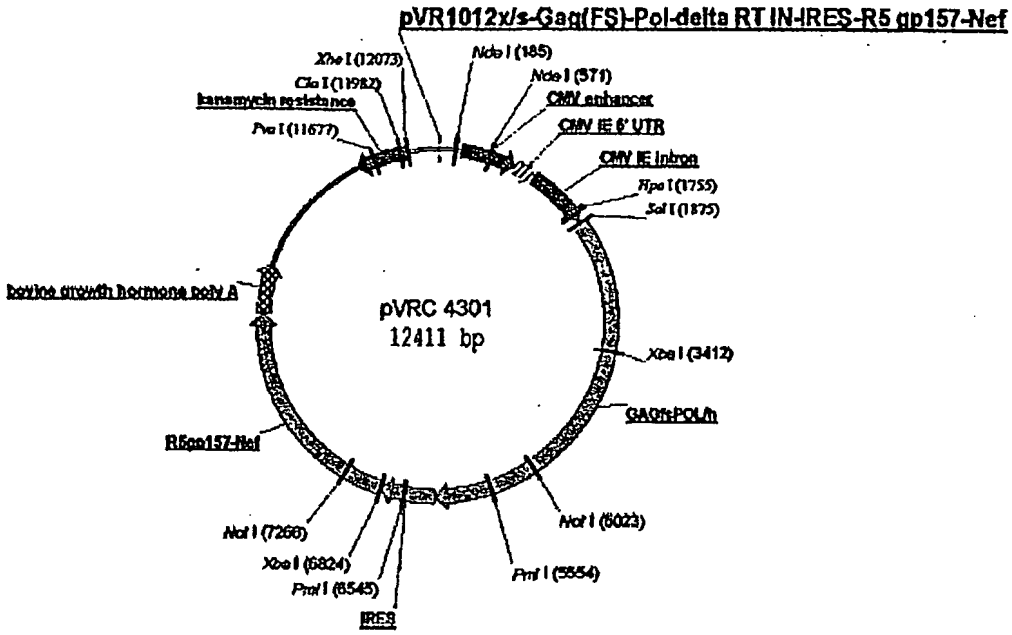

pVR1012x/s-Gag(FS)-Pol-delta RT IN-IRES-R5 gp157-Nef
pVRC 4301
12411 bp
Xho I (12073)
Cla I (11982)
kanamycin resistance
Pvu I (11677)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
Kpn I (1755)
Sal I (1875)
Xba I (3412)
GAGfs-POLfs
Not I (6023)
Pml I (5554)
Not I (7266)
Xba I (6824)
Pml I (6545)
IRES
R5gp157-Nef
bovine growth hormone poly A

Figure 165

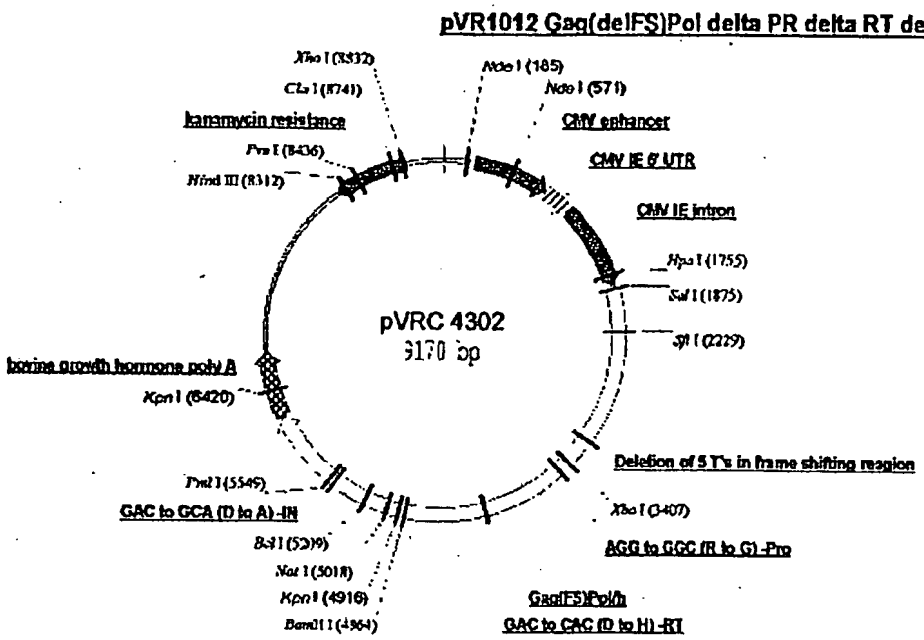

pVR1012 Gag(delFS)Pol delta PR delta RT delta IN/h
Xho I (8532)
Cla I (8741)
kanamycin resistance
Pvu I (8436)
Hind III (8312)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Spl I (2229)
pVRC 4302
6170 bp
bovine growth hormone poly A
Xpn I (6420)
Deletion of 5 T's in frame shifting region
Xho I (3407)
AGG to GGC (R to G) -Pro
Gag(FS)Pol/h
GAC to CAC (D to H) -RT
Pml I (5549)
GAC to GCA (D to A) -IN
Bst1 (5239)
Not I (5018)
Kpn I (4916)
BamH I (4864)

Figure 166

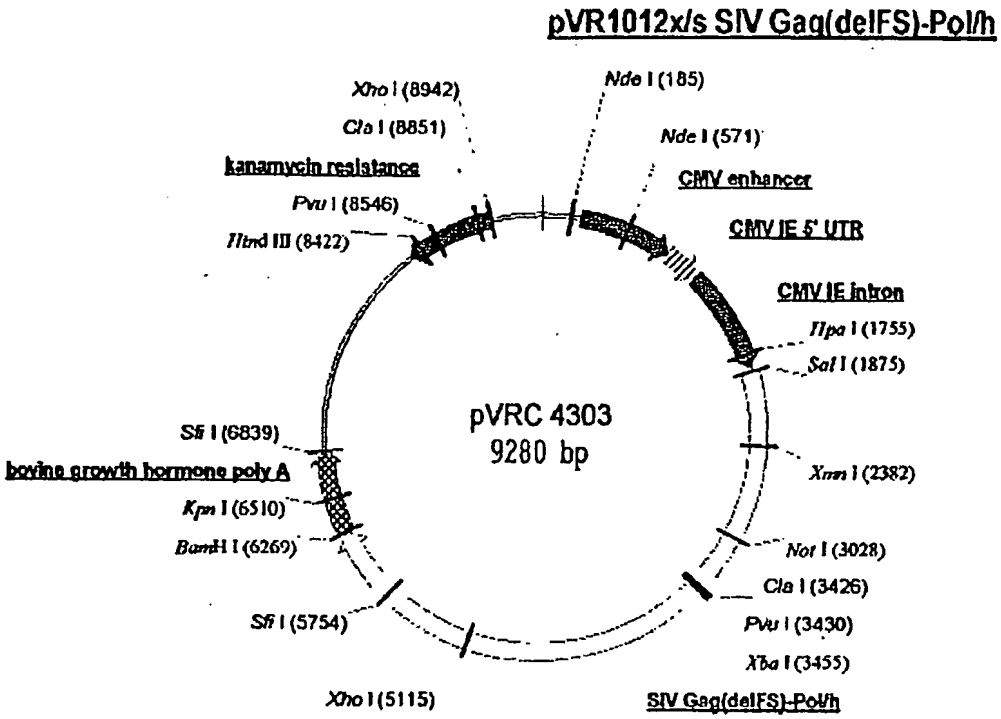

pVR1012x/s SIV Gag(delFS)-Pol/h
pVRC 4303
9280 bp
Xho I (8942)
Cla I (8851)
kanamycin resistance
Pvu I (8546)
Hind III (8422)
Nde I (185)
Nde I (571)
CMV enhancer
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Xmn I (2382)
Not I (3028)
Cla I (3426)
Pvu I (3430)
Xba I (3455)
SIV Gag(delFS)-Pol/h
Xho I (5115)
Sfi I (5754)
BamH I (6269)
Kpn I (6510)
bovine growth hormone poly A
Sfi I (6839)

Figure 167

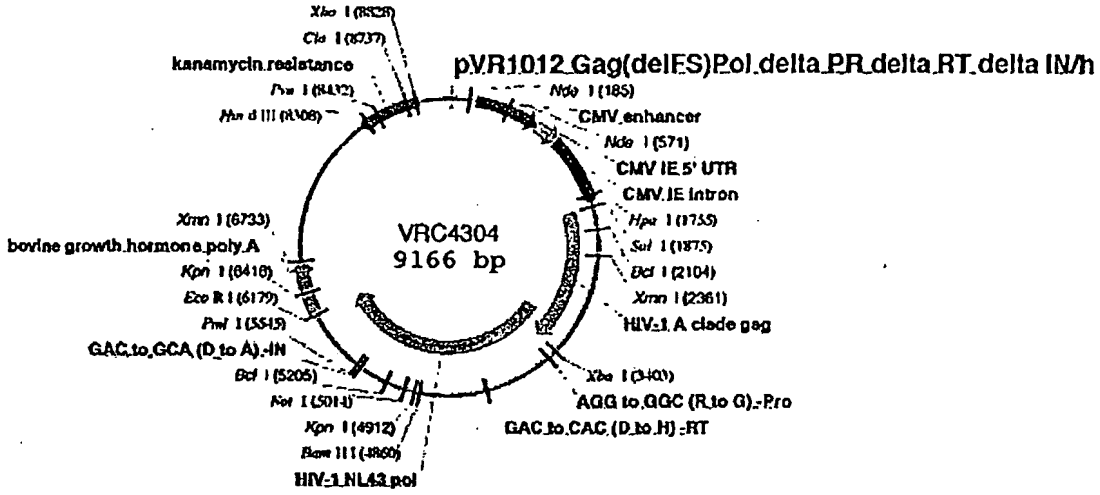

pVR1012 Gag(delES)Pol delta PR delta RT delta IN/h
VRC4304
9166 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
HIV-1 A clade gag
AGG to GGC (R to G) -Pro
GAC to CAC (D to H) -RT
HIV-1 NL43 pol
GAC to GCA (D to A) -IN
bovine growth hormone poly A

Figure 168

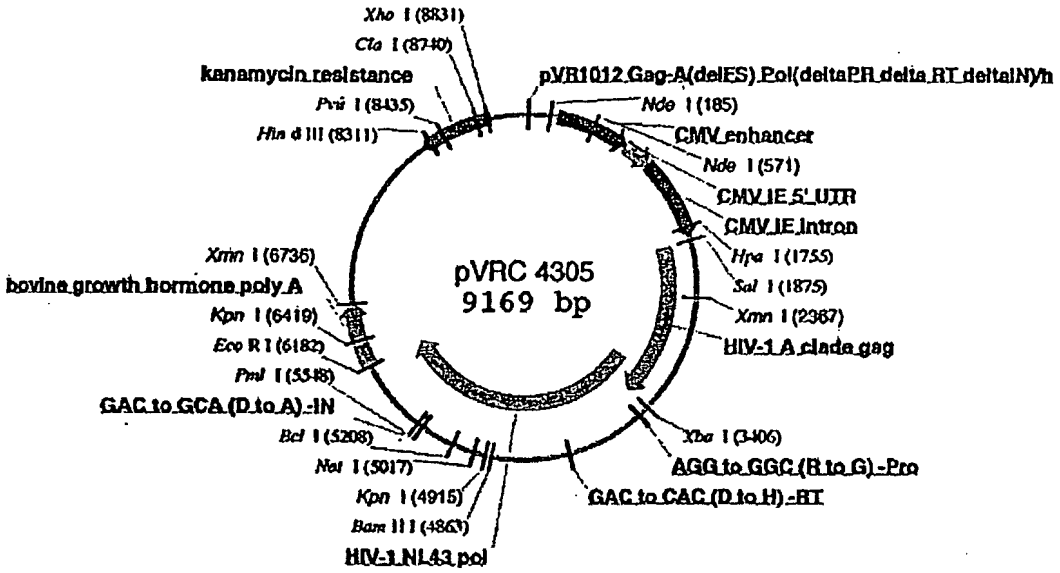

pVRC 4305
9169 bp
Xho I (8831)
Cla I (8740)
kanamycin resistance
Pvu I (8435)
Hin d III (8311)
pVR1012 Gag-A(delES) Pol(deltaPR delta RT deltaINyh
Nde I (185)
CMV enhancer
Nde I (571)
CMV IE 5' UTR
CMV IE intron
Hpa I (1755)
Sal I (1875)
Xmn I (2387)
HIV-1 A clade gag
Xba I (3406)
AGG to GGC (R to G) -Pro
GAC to CAC (D to H) -RT
Kpn I (4915)
Bam III (4863)
HIV-1 NL43 pol
Nsi I (5017)
Bcl I (5208)
GAC to GCA (D to A) -IN
Pml I (5548)
Eco R I (6182)
Kpn I (6419)
bovine growth hormone poly A
Xmn I (6736)

Figure 169

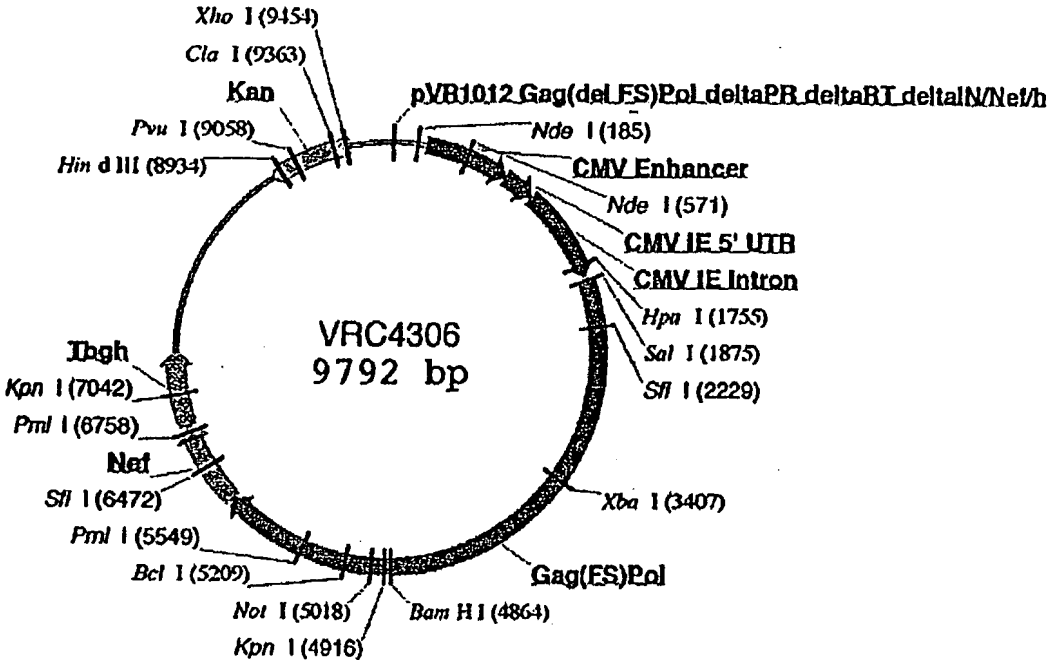

Xho I (9454)
Cla I (9363)
Kan
pVR1012 Gag(delES)Pol deltaPR deltaRT deltaIN/Nef/h
Pvu I (9058)
Nde I (185)
Hin d III (8934)
CMV Enhancer
Nde I (571)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
VRC4306
9792 bp
Sal I (1875)
Sfi I (2229)
Tbgh
Kpn I (7042)
Pml I (6758)
Nef
Sfi I (6472)
Xba I (3407)
Pml I (5549)
Bcl I (5209)
Gag(ES)Pol
Not I (5018)
Bam H I (4864)
Kpn I (4916)

Figure 170

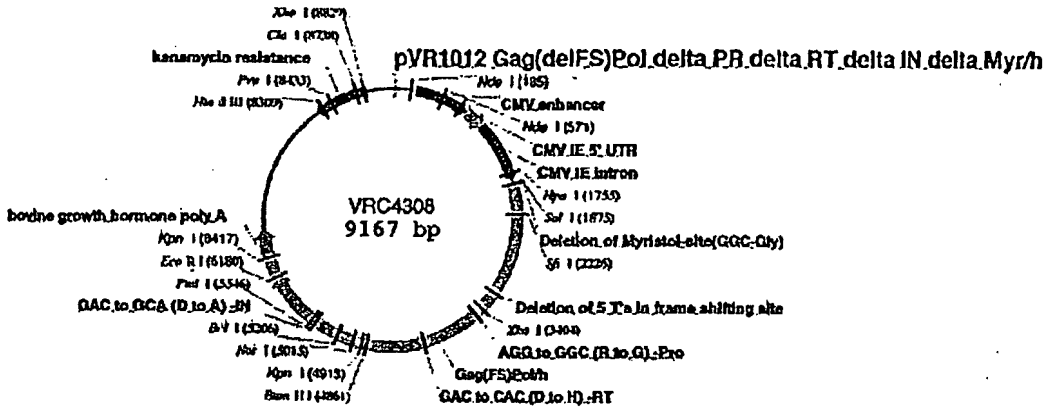

pVR1012 Gag(delFS)Pol delta PR delta RT delta IN delta Myr/h
VRC4308
9167 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
bovine growth hormone poly A
Deletion of Myristoleate(GGC-Gly)
Deletion of 5 T's in frame shifting site
AGG to GGC (R to G) - Pro
Gag(FS)Pol/h
GAC to CAC (D to H) - RT
GAC to GCA (D to A) - IN

Figure 171

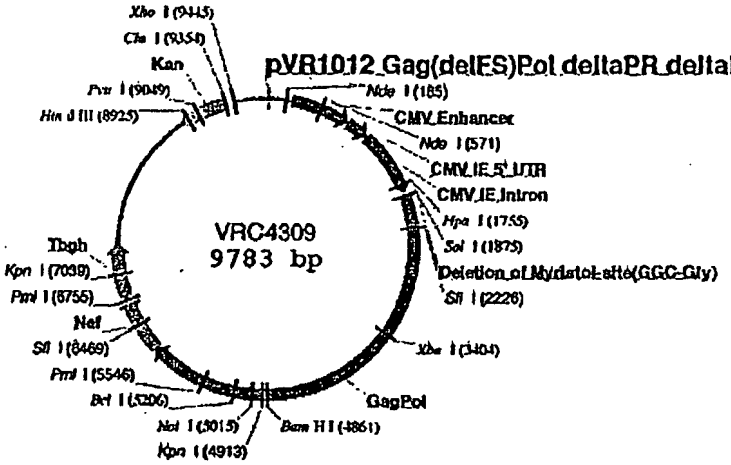

pVR1012 Gag(delES)Pol deltaPR deltaRT deltaIN delta Myr/Nef/h
VRC4309
9783 bp
Xho I (9445)
Cla I (9354)
Kan
Pvu I (9049)
Hin d III (8925)
Nde I (185)
CMV Enhancer
Nde I (571)
CMV IE 5' UTR
CMV IE Intron
Hpa I (1755)
Sal I (1875)
Deletion of Myristoleate(GGC-Gly)
Sfi I (2226)
Xba I (3404)
GagPol
BamH I (4861)
Kpn I (4913)
Nsi I (5015)
Bcl I (5206)
Pml I (5546)
Sfi I (8469)
Nef
Pml I (8756)
Kpn I (9039)
Tbgh

Figure 172

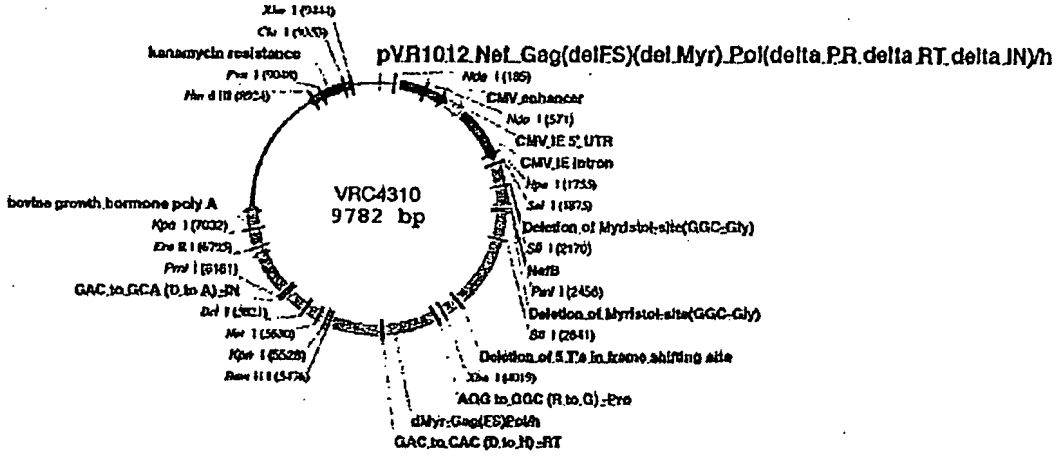

pVR1012.Net_Gag(delES)(del.Myr).Pol(delta.PR.delta.RT.delta.IN)/h
VRC4310
9782 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
bovine growth hormone poly A
Deletion of Myristoylation site(GGC-Gly)
NefB
Deletion of Myristoylation site(GGC-Gly)
Deletion of 5 T's in frame shifting site
AGG to GGC (R to G) -Pro
dMyr-Gag(ES)Pol/h
GAC to CAC (D to H) -RT
GAC to GCA (D to A) -IN

Figure 173

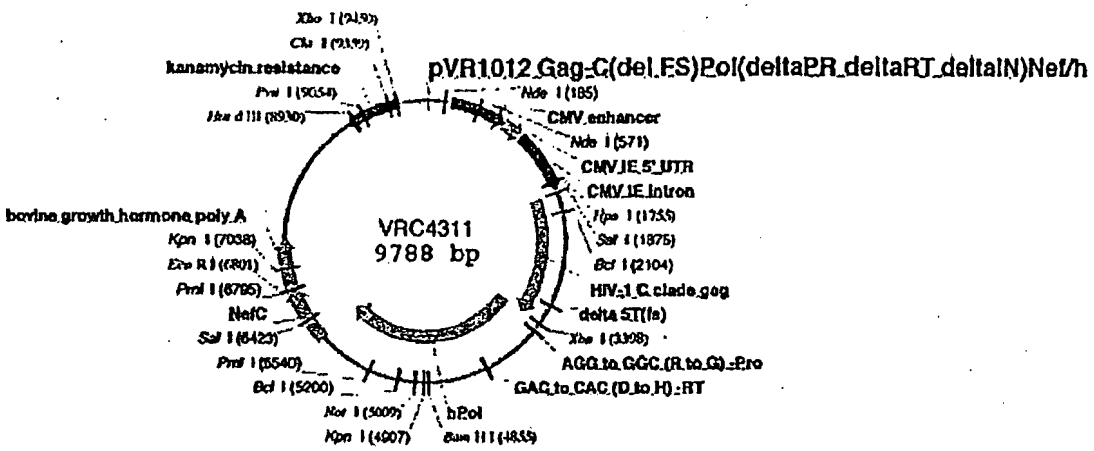

pVR1012 Gag-C(del ES)Pol(deltaPR deltaRT deltaIN)Nef/h
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
HIV-1 C clade gag
delta ST(fs)
AGG to GGC (R to G) -Pro
GAC to CAC (D to H) -RT
hPol
NefC
bovine growth hormone poly A
VRC4311
9788 bp

Figure 174

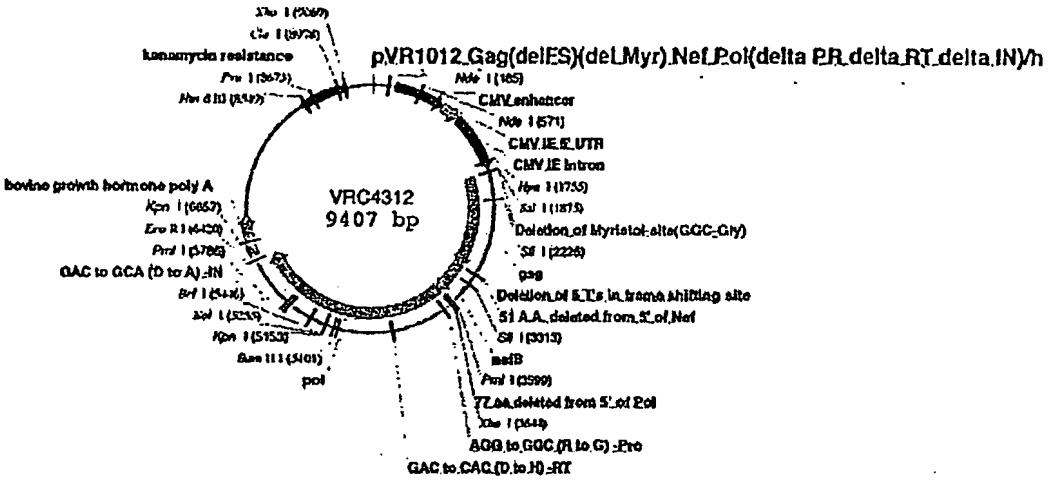

pVR1012 Gag(delES)(delMyr) Nef Pol(delta PR delta RT delta IN)/h
VRC4312
9407 bp
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE intron
Deletion of Myristoleate(GGC-Gly)
gag
Deletion of 5 Ts in frame shifting site
51 A.A. deleted from 5' of Nef
nefB
7 A.A deleted from 5' of Pol
AGG to GGC (R to G) -Pro
GAC to CAC (D to H) -RT
pol
GAC to GCA (D to A) -IN
bovine growth hormone poly A

Figure 175

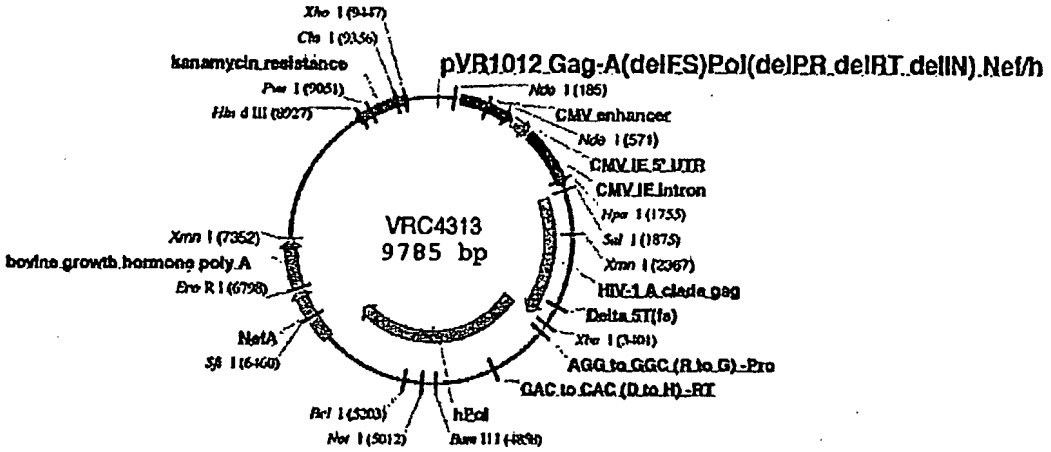

pVR1012.Gag-A(delES)Pol(delPR.delRT.delIN).Nef/h
kanamycin resistance
CMV enhancer
CMV IE 5' UTR
CMV IE Intron
HIV-1 A clade gag
Delta ST(Is)
AGG to GGC (R to G) -Pro
GAC to CAC (D to H) -RT
hPol
bovine growth hormone poly A
NefA
VRC4313
9785 bp

Figure 176

SEQUENCE LISTING

<110> THE GOVERNMENT OF THE UNITED STATES OF AMERICA, AS REPRESENTED
BY THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES
NABLE, Gary J.
CHAKRABARTI, Bimal K.
HUANG, Yue

<120> MODIFICATIONS OF HIV Env, Gag, AND Pol
ENHANCE IMMUNOGENICITY FOR GENETIC IMMUNIZATION

<130> NIH206.001VPC

<140> UNKNOWN
<141>

<150> US 60/225,097
<151> 2000-08-14

<150> US 60/252,115
<151> 2000-11-14

<150> US 60/279,257
<151> 2001-03-28

<160> 176

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 7547
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 1
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960

tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga acaccatgcg 1920
cgtgaaggag aagtaccagc acctgtggcg ctggggctgg cgctggggca ccatgctgct 1980
gggcatgctg atgatctgca gcgccaccga gaagctgtgg gtgaccgtgt actacggcgt 2040
gcccgtgtgg aaggaggcca ccaccaccct gctctgcgcc agcgacgcca aggcctacga 2100
caccgaggtg cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaaccccca 2160
ggaggtggtg ctggtgaacg tgaccgagaa cttcgacatg tggaagaacg acatggtgga 2220
gcagatgcac gaggacatca tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct 2280
gacccccctg tgcgtgagcc tgaagtgcac cgacctgaag aacgacacca acaccaacag 2340
cagcagcggc cgcatgatca tggagaaggg cgagatcaag aactgcagct tcaacatcag 2400
caccagcatc cgcggcaagg tgcagaagga gtacgccttc ttctacaagc tggacatcat 2460
ccccatcgac aacgacacca ccagctacag cctgaccagc tgcaacacca gcgtgatcac 2520
ccaggcctgc cccaaggtga gcttcgagcc catccccaac cactactgcg cccccgccgg 2580
cttcaccatc ctgaagtgca aggacaagaa gttcaacggc aagggccccc gcaccaacgt 2640
gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg agcacccagc tgctgctgaa 2700
cgaccgcctg gccgaggagg aggtggtgat ccgcagcgcc aacttcgccg acaacgccaa 2760
ggtgatcatc gtgcagctga acgagagcgt ggagatcaac tgcacccgcc ccaacaacaa 2820
cacccgcaag agcatccaca tcggccccgg ccgcgccttc tacaccaccg gcgagatcat 2880
cggcgacatc cgccaggccc actgcaacct gagccgcgcc aagtggaacg acaccctgaa 2940
caagatcgtg atcaagctgc gcgagcagtt cggcaacaag accatcgtgt tcaagcacag 3000
cagcggcggc gaccccgaga tcgtgaccca cagcttcaac tgcggcggcg agttcttcta 3060
ctgcaacagc acccagctgt tcaacagcac ctggttcaac agcacctgga gcaccgaggg 3120
cagcaacaac accgagggca gcgacaccat caccctgccc tgccgcatca agcagatcat 3180
caacatgtgg cagaaggtgg gcaaggccat gtacgccccc cccatcagcg gccagatccg 3240
ctgcagcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaaca gcaacaacga 3300
gagcgagatc ttccgcctgg gcggcggcga catgcgcgac aactggcgca gcgagctgta 3360
caagtacaag gtggtgaaga tcgagcccct gggcgtggcc cccaccaagg ccaagcgccg 3420
cgtggtgcag cgcgagaagc gcgccgtggg catcggcgcc ctgttcctgg gcttcctggg 3480
cgccgccggc agcaccatgg gcgccgccag catgaccctg accgtgcagg cccgccagct 3540
gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg cccagcagca 3600
cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc tggccgtgga 3660
gcgctacctg aaggaccagc agctgctggg catctggggc tgcagcggca agcttatctg 3720
caccaccgcc gtgccctgga acgccagctg gagcaacaag agcctggagc agatctggaa 3780
ccacaccacc tggatggagt gggaccgcga gatcaacaac tacaccagcc tgatccacag 3840
cctgatcgag gagagccaga accagcagga gaagaacgag caggagctgc tggagctgga 3900
caagtgggcc agcatgggcg gcaagtggag caagagcagc gtgatcggct ggcccgccgt 3960
gcgcgagcgc atgcgccgcg ccgagcccgc cgccgacggc gtgggcgccg tgagccgcga 4020
cctggagaag cacggcgcca tcaccagcag caacaccgcc gccaacaacg ccgcctgcgc 4080
ctggctggag gcccaggagg aggaggaggt gggcttcgca gtgaccgcac aggtggcact 4140
gcgcgcaatg acctacaagg ccgccgtgga cctgagccac ttcctgaagg agaagggcgg 4200
cctggagggc ctgatccaca gccagcgccg ccaggacatc ctggacctgt ggatctacca 4260

cacccagggc tacttccccg actggcagaa ctacacccc ggccccggcg tgcgctaccc 4320
cctgaccttc ggctggtgct acaagctggt gcccgtggag cccgacaagg tggaggaggc 4380
caacaagggc gagaacacca gcctgctgca ccccgtgagc ctgcacggca tggcagcacc 4440
cgagcgcgag gtgctggagt ggcgcttcga cagccgcctg gccttccacc acgtggcccg 4500
cgagctgcac cccgagtact tcaagaactg ctgaggatcc agatctgctg tgccttctag 4560
ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac 4620
tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga gtaggtgtca 4680
ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg aagacaatag 4740
caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga attgacccgg 4800
ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac cctgtccacg 4860
cccctggttc ttagttccag ccccactcat aggacactca tagctcagga gggctccgcc 4920
ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca gcccaccaaa 4980
ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt aagtgcagag 5040
ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga attttaaggc 5100
catcatggcc ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc 5160
tgcggcgagc ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg 5220
ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg 5280
ccgcgttgct ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac 5340
gctcaagtca gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg 5400
gaagctccct cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct 5460
ttctcccttc gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg 5520
tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct 5580
gcgccttatc cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac 5640
tggcagcagc cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt 5700
tcttgaagtg gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc 5760
tgctgaagcc agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca 5820
ccgctggtag cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat 5880
ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac 5940
gttaagggat tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt 6000
aaaaatgaag ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc 6060
aatgcttaat cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg 6120
cctgactcgg gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat 6180
accaggcctg aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag 6240
ctttgttgta ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg 6300
cgttgtcggg aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac 6360
aaagccgccg tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa 6420
ttctgattag aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt 6480
atcaatacca tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca 6540
gttccatagg atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat 6600
acaacctatt aatttccgct cgtcaaaaat aaggttatca agtgagaaat caccatgagt 6660
gacgactgaa tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac 6720
aggccagcca ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg 6780
tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg 6840
aatcgaatgc aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc 6900
aggatattct tctaatacct ggaatgctgt tttcccgggg atcgcagtgg tgagtaacca 6960
tgcatcatca ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag 7020
ccagtttagt ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt 7080
cagaaacaac tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg 7140
cccgacatta tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa 7200
tcgcggcctc gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact 7260
gtttatgtaa gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta 7320
acatcagaga ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta 7380
tcagggttat tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat 7440
aggggttccg cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat 7500
catgacatta acctataaaa ataggcgtat cacgaggccc tttcgtc 7547

<210> 2
<211> 8009
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 2
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga acaccatgcg 1920
cgtgaaggag aagtaccagc acctgtggcg ctggggctgg cgctggggca ccatgctgct 1980
gggcatgctg atgatctgca gcgccaccga gaagctgtgg gtgaccgtgt actacggcgt 2040
gcccgtgtgg aaggaggcca ccaccaccct gctctgcgcc agcgacgcca aggcctacga 2100
caccgaggtg cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaaccccca 2160
ggaggtggtg ctggtgaacg tgaccgagaa cttcgacatg tggaagaacg acatggtgga 2220
gcagatgcac gaggacatca tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct 2280
gaccccctg tgcgtgagcc tgaagtgcac cgacctgaag aacgacacca acaccaacag 2340
cagcagcggc cgcatgatca tggagaaggg cgagatcaag aactgcagct tcaacatcag 2400
caccagcatc cgcggcaagg tgcagaagga gtacgccttc ttctacaagc tggacatcat 2460
ccccatcgac aacgacacca ccagctacag cctgaccagc tgcaacacca gcgtgatcac 2520
ccaggcctgc cccaaggtga gcttcgagcc catccccaac cactactgcg cccccgccgg 2580

cttcaccatc ctgaagtgca aggacaagaa gttcaacggc aagggcccct gcaccaacgt 2640
gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg agcacccagc tgctgctgaa 2700
cgaccgcctg gccgaggagg aggtggtgat ccgcagcgcc aacttcgccg acaacgccaa 2760
ggtgatcatc gtgcagctga acgagagcgt ggagatcaac tgcacccgcc ccaacaacaa 2820
cacccgcaag agcatccaca tcggcccccgg ccgcgccttc tacaccaccg gcgagatcat 2880
cggcgacatc cgccaggccc actgcaacct gagccgcgcc aagtggaacg acaccctgaa 2940
caagatcgtg atcaagctgc gcgagcagtt cggcaacaag accatcgtgt tcaagcacag 3000
cagcggcggc gaccccgaga tcgtgaccca cagcttcaac tgcggcggcg agttcttcta 3060
ctgcaacagc acccagctgt tcaacagcac ctggttcaac agcacctgga gcaccgaggg 3120
cagcaacaac accgagggca gcgacaccat caccctgccc tgccgcatca agcagatcat 3180
caacatgtgg cagaaggtgg gcaaggccat gtacgccccc cccatcagcg gccagatccg 3240
ctgcagcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaaca gcaacaacga 3300
gagcgagatc ttccgcctgg gcggcggcga catgcgcgac aactggcgca gcgagctgta 3360
caagtacaag gtggtgaaga tcgagcccct gggcgtggcc cccaccaagg ccaagcgccg 3420
cgtggtgcag cgcgagaagc gcgccgtggg catcggcgcc ctgttcctgg gcttcctggg 3480
cgccgccggc agcaccatgg gcgccgccag catgaccctg accgtgcagg cccgccagct 3540
gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg cccagcagca 3600
cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc tggccgtgga 3660
gcgctacctg aaggaccagc agctgctggg catctggggc tgcagcggca agcttatctg 3720
caccaccgcc gtgccctgga acgccagctg gagcaacaag agcctggagc agatctggaa 3780
ccacaccacc tggatggagt gggaccgcga gatcaacaac tacaccagcc tgatccacag 3840
cctgatcgag gagagccaga accagcagga gaagaacgag caggagctgc tggagctgga 3900
caagtgggcc agcctgtgga actggttcaa catcaccaac tggctgtggt acatcaagct 3960
gttcatcatg atcgtgggcg gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat 4020
cgtgaaccgc gtgcgccagg gctacagccc cctgagcttc cagacccacc tgcccatccc 4080
ccgcggcccc gaccgccccg agggcatcga ggaggagggc ggcgagcgcg accgcgaccg 4140
cacgatccgc ctggtgaacg gcagcctggc cctgatctgg gacgacctgc gcagcctgtg 4200
cctgttcagc taccaccgcc tgcgcgacct gctgctgatc gtgacccgca tcgtggagct 4260
gctgggccgc cgcggctggg aggccctgaa gtactggtgg aacctgctgc agtactggag 4320
ccaggagctg aagaacagcg ccgtgagcct gctgaacgcc accgccatca tgggcggcaa 4380
gtggagcaag agcagcgtga tcggctggcc cgccgtgcgc gagcgcatgc gccgcgccga 4440
gcccgccgcc gacggcgtgg gcgccgtgag ccgcgacctg gagaagcacg gcgccatcac 4500
cagcagcaac accgccgcca acaacgccgc ctgcgcctgg ctggaggccc aggaggagga 4560
ggaggtgggc ttcgcagtga ccgcacaggt ggcactgcgc gcaatgacct acaaggccgc 4620
cgtggacctg agccacttcc tgaaggagaa gggcggcctg gagggcctga tccacagcca 4680
gcgccgccag gacatcctgg acctgtggat ctaccacacc cagggctact tccccgactg 4740
gcagaactac acccccggcc ccggcgtgcg ctaccccctg accttcggct ggtgctacaa 4800
gctggtgccc gtggagcccg acaaggtgga ggaggccaac aagggcgaga acaccagcct 4860
gctgcacccc gtgagcctgc acggcatggc agcacccgag cgcgaggtgc tggagtggcg 4920
cttcgacagc cgcctggcct tccaccacgt ggcccgcgag ctgcaccccg agtacttcaa 4980
gaactgctga ggatccggat ccagatctgc tgtgccttct agttgccagc catctgttgt 5040
ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta 5100
ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg 5160
ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc 5220
ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa 5280
gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc 5340
agccccactc ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa 5400
agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag 5460
agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca 5520
acatgtgagg aagtaatgag agaaatcata gaattttaag gccatcatgg ccttaatctt 5580
ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag 5640
ctcactcaaa ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca 5700
tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 5760
tccataggct ccgcccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 5820
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 5880

ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 5940
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 6000
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact 6060
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 6120
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 6180
actacggcta cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct 6240
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 6300
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 6360
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 6420
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 6480
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 6540
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag 6600
ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc 6660
catcatccag ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc 6720
agttggtgat tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg 6780
tgatctgatc cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca 6840
agtcagcgta atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc 6900
atcgagcatc aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg 6960
aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag 7020
atcctggtat cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc 7080
ctcgtcaaaa ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga 7140
gaatggcaaa agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc 7200
gtcatcaaaa tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag 7260
acgaaatacg cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg 7320
caggaacact gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac 7380
ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg 7440
gataaaatgc ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat 7500
ctcatctgta acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc 7560
atcgggcttc ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc 7620
ccatttatac ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga 7680
cgtttcccgt tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag 7740
ttttattgtt catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga 7800
cacaacgtgg ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat 7860
gagcggatac atatttgaat gtatttagaa aaataaacaa ataggggttc cgcgcacatt 7920
tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa 7980
aaataggcgt atcacgaggc cctttcgtc 8009

<210> 3
<211> 7558
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 3
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420

cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720

atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcat gggcggcaag tggagcaaga gcagcgtgat cggctggccc 3960
gccgtgcgcg agcgcatgcg ccgcgccgag cccgccgccg acggcgtggg cgccgtgagc 4020
cgcgacctgg agaagcacgg cgccatcacc agcagcaaca ccgccgccaa caacgccgcc 4080
tgcgcctggc tggaggccca ggaggaggag gaggtgggct tcgcagtgac cgcacaggtg 4140
gcactgcgcg caatgaccta caaggccgcc gtggacctga gccacttcct gaaggagaag 4200
ggcggcctgg agggcctgat ccacagccag cgccgccagg acatcctgga cctgtggatc 4260
taccacaccc agggctactt ccccgactgg cagaactaca ccccggccc cggcgtgcgc 4320
taccccctga ccttcggctg gtgctacaag ctggtgcccg tggagcccga caaggtggag 4380
gaggccaaca agggcgagaa caccagcctg ctgcaccccg tgagcctgca cggcatggca 4440
gcacccgagc gcgaggtgct ggagtggcgc ttcgacagcc gcctggcctt ccaccacgtg 4500
gcccgcgagc tgcaccccga gtacttcaag aactgctgag gatccggatc cagatctgct 4560
gtgccttcta gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg 4620
gaaggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg 4680
agtaggtgtc attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg 4740
gaagacaata gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag 4800
aattgacccg gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca 4860
ccctgtccac gcccctggtt cttagttcca gccccactca taggacactc atagctcagg 4920
agggctccgc cttcaatccc acccgctaaa gtacttggag cggtctctcc ctccctcatc 4980
agcccaccaa accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat 5040
taagtgcaga gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag 5100
aattttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 5160
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 5220
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 5280
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccccctg acgagcatca 5340
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 5400
gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 5460
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 5520
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac ccccgttca 5580
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 5640
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 5700
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 5760
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 5820
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5880
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5940
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 6000
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 6060
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 6120
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 6180
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 6240
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 6300
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 6360
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 6420
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 6480
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 6540
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 6600
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 6660
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 6720
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 6780
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6840
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6900
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccccggg gatcgcagtg 6960
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 7020

aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 7080
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 7140
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 7200
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 7260
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 7320
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 7380
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 7440
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 7500
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 7558

<210> 4
<211> 7351
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 4
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040

cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
ggtggcaagt ggtcaaaaag tagtgtgatt ggatggcctg ctgtaaggga aagaatgaga 3780
cgagctgagc cagcagcaga tggggtggga gcagtatctc gagacctaga aaaacatgga 3840
gcaatcacaa gtagcaatac agcagctaac aatgctgctt gtgcctggct agaagcacaa 3900
gaggaggaag aggtgggttt tccagtcaca cctcaggtac ctttaagacc aatgacttac 3960
aaggcagctg tagatcttag ccacttttta aaagaaaagg ggggactgga agggctaatt 4020
cactcccaaa gaagacaaga tatccttgat ctgtggatct accacacaca aggctacttc 4080
cctgattggc agaactacac accagggcca ggggtcagat atccactgac ctttggatgg 4140
tgctacaagc tagtaccagt tgagccagat aaggtagaag aggccaataa aggagagaac 4200
accagcttgt tacaccctgt gagcctgcat ggaatggatg accctgagag agaagtgtta 4260
gagtggaggt ttgacagccg cctagcattt catcacgtgg cccgagagct gcatccggag 4320
tacttcaaga actgctgagg atccagatct gctgtgcctt ctagttgcca gccatctgtt 4380
gtttgccctt cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc 4440
taataaaatg aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggggt 4500
ggggtggggc aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat 4560
gcggtgggct ctatgggtac ccaggtgctg aagaattgac ccggttcctc ctgggccaga 4620
aagaagcagg cacatccccc tctctgtgac acaccctgtc cacgcccctg gttcttagtt 4680
ccagccccac tcataggaca ctcatagctc aggagggctc cgccttcaat cccacccgct 4740
aaagtacttg gagcggtctc tccctccctc atcagcccac caaaccaaac ctagcctcca 4800
agagtgggaa gaaattaaag caagataggc tattaagtgc agagggagag aaaatgcctc 4860
caacatgtga ggaagtaatg agagaaatca tagaatttta aggccatcat ggccttaatc 4920
ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc gagcggtatc 4980
agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg caggaaagaa 5040
catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt 5100
tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa gtcagaggtg 5160
gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct ccctcgtgcg 5220
ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc cttcgggaag 5280
cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg tcgttcgctc 5340

caagctgggc tgtgtgcacg aacccccgt tcagcccgac cgctgcgcct tatccggtaa 5400
ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag cagccactgg 5460
taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga agtggtggcc 5520
taactacggc tacactagaa gaacagtatt tggtatctgc gctctgctga agccagttac 5580
cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg gtagcggtgg 5640
ttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag aagatccttt 5700
gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag ggattttggt 5760
catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat gaagttttaa 5820
atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct taatcagtga 5880
ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac tcgggggggg 5940
ggggcgctga ggtctgcctc gtgaagaagg tgttgctgac tcataccagg cctgaatcgc 6000
cccatcatcc agccagaaag tgagggagcc acggttgatg agagctttgt tgtaggtgga 6060
ccagttggtg attttgaact tttgctttgc cacggaacgg tctgcgttgt cgggaagatg 6120
cgtgatctga tccttcaact cagcaaaagt tcgatttatt caacaaagcc gccgtcccgt 6180
caagtcagcg taatgctctg ccagtgttac aaccaattaa ccaattctga ttagaaaaac 6240
tcatcgagca tcaaatgaaa ctgcaattta ttcatatcag gattatcaat accatatttt 6300
tgaaaaagcc gtttctgtaa tgaaggagaa aactcaccga ggcagttcca taggatggca 6360
agatcctggt atcggtctgc gattccgact cgtccaacat caatacaacc tattaatttc 6420
ccctcgtcaa aaataaggtt atcaagtgag aaatcaccat gagtgacgac tgaatccggt 6480
gagaatggca aaagcttatg catttctttc cagacttgtt caacaggcca gccattacgc 6540
tcgtcatcaa aatcactcgc atcaaccaaa ccgttattca ttcgtgattg cgcctgagcg 6600
agacgaaata cgcgatcgct gttaaaagga caattacaaa caggaatcga atgcaaccgg 6660
cgcaggaaca ctgccagcgc atcaacaata ttttcacctg aatcaggata ttcttctaat 6720
acctggaatg ctgttttccc ggggatcgca gtggtgagta accatgcatc atcaggagta 6780
cggataaaat gcttgatggt cggaagaggc ataaattccg tcagccagtt tagtctgacc 6840
atctcatctg taacatcatt ggcaacgcta cctttgccat gtttcagaaa caactctggc 6900
gcatcgggct tcccatacaa tcgatagatt gtcgcacctg attgcccgac attatcgcga 6960
gcccatttat acccatataa atcagcatcc atgttggaat ttaatcgcgg cctcgagcaa 7020
gacgtttccc gttgaatatg gctcataaca ccccttgtat tactgtttat gtaagcagac 7080
agttttattg ttcatgatga tatatttta tcttgtgcaa tgtaacatca gagattttga 7140
gacacaacgt ggctttcccc ccccccccat tattgaagca tttatcaggg ttattgtctc 7200
atgagcggat acatatttga atgtatttag aaaaataaac aaatagggt tccgcgcaca 7260
tttccccgaa aagtgccacc tgacgtctaa gaaaccatta ttatcatgac attaacctat 7320
aaaaataggc gtatcacgag gccctttcgt c 7351

<210> 5
<211> 8008
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 5
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540

tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840

cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agcccccctga gcttccagac ccacctgccc 4080
atcccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc ctggccctga tctgggacga cctgcgcagc 4200
ctgtgcctgt tcagctacca ccgcctgcgc gacctgctgc tgatcgtgac ccgcatcgtg 4260
gagctgctgg gccgccgcgg ctgggaggcc ctgaagtact ggtggaacct gctgcagtac 4320
tggagccagg agctgaagaa cagcgccgtg agcctgctga acgccaccgc catcatgggc 4380
ggcaagtgga gcaagagcag cgtgatcggc tggcccgccg tgcgcgagcg catgcgccgc 4440
gccgagcccg ccgccgacgg cgtgggcgcc gtgagccgcg acctggagaa gcacggcgcc 4500
atcaccagca gcaacaccgc cgccaacaac gccgcctgcg cctggctgga ggcccaggag 4560
gaggaggagg tgggcttcgc agtgaccgca caggtggcac tgcgcgcaat gacctacaag 4620
gccgccgtgg acctgagcca cttcctgaag gagaagggcg gcctggaggg cctgatccac 4680
agccagcgcc gccaggacat cctggacctg tggatctacc acacccaggg ctacttcccc 4740
gactggcaga actacacccc cggccccggc gtgcgctacc ccctgacctt cggctggtgc 4800
tacaagctgg tgcccgtgga gcccgacaag gtggaggagg ccaacaaggg cgagaacacc 4860
agcctgctgc accccgtgag cctgcacggc atggcagcac ccgagcgcga ggtgctggag 4920
tggcgcttcg acagccgcct ggccttccac cacgtggccc gcgagctgca ccccgagtac 4980
ttcaagaact gctgaggatc cagatctgct gtgccttcta gttgccagcc atctgttgtt 5040
tgcccctccc ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa 5100
taaaatgagg aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg 5160
gtggggcagg acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg 5220
gtgggctcta tgggtaccca ggtgctgaag aattgacccg gttcctcctg ggccagaaag 5280
aagcaggcac atccccttct ctgtgacaca ccctgtccac gcccctggtt cttagttcca 5340
gccccactca taggacactc atagctcagg agggctccgc cttcaatccc acccgctaaa 5400
gtacttggag cggtctctcc ctcccctcatc agcccaccaa accaaaccta gcctccaaga 5460
gtgggaagaa attaaagcaa gataggctat taagtgcaga gggagagaaa atgcctccaa 5520
catgtgagga agtaatgaga gaaatcatag aattttaagg ccatcatggc cttaatcttc 5580
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 5640
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat 5700
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 5760
ccataggctc cgccccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 5820
aaacccgaca ggactataaa gataccaggc gtttcccccct ggaagctccc tcgtgcgctc 5880
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 5940
ggcgctttct catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 6000
gctgggctgt gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta 6060
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 6120
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 6180
ctacggctac actagaagaa cagtatttgg tatctgcgct ctgctgaagc cagttacctt 6240
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 6300
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 6360
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 6420
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 6480
aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 6540
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcg gggggggggg 6600
gcgctgaggt ctgcctcgtg aagaaggtgt tgctgactca taccaggcct gaatcgcccc 6660
atcatccagc cagaaagtga gggagccacg gttgatgaga gctttgttgt aggtggacca 6720
gttggtgatt ttgaactttt gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt 6780
gatctgatcc ttcaactcag caaaagttcg atttattcaa caaagccgcc gtcccgtcaa 6840
gtcagcgtaa tgctctgcca gtgttacaac caattaacca attctgatta gaaaaactca 6900
tcgagcatca aatgaaactg caatttattc atatcaggat tatcaatacc atatttttga 6960
aaaagccgtt tctgtaatga aggagaaaac tcaccgaggc agttccatag gatggcaaga 7020
tcctggtatc ggtctgcgat tccgactcgt ccaacatcaa tacaacctat taatttcccc 7080
tcgtcaaaaa taaggttatc aagtgagaaa tcaccatgag tgacgactga atccggtgag 7140

aatggcaaaa gcttatgcat ttctttccag acttgttcaa caggccagcc attacgctcg 7200
tcatcaaaat cactcgcatc aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga 7260
cgaaatacgc gatcgctgtt aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc 7320
aggaacactg ccagcgcatc aacaatattt tcacctgaat caggatattc ttctaatacc 7380
tggaatgctg ttttccccgg gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg 7440
ataaaatgct tgatggtcgg aagaggcata aattccgtca gccagtttag tctgaccatc 7500
tcatctgtaa catcattggc aacgctacct ttgccatgtt tcagaaacaa ctctggcgca 7560
tcgggcttcc catacaatcg atagattgtc gcacctgatt gcccgacatt atcgcgagcc 7620
catttatacc catataaatc agcatccatg ttggaattta atcgcggcct cgagcaagac 7680
gtttcccgtt gaatatggct cataacaccc cttgtattac tgtttatgta agcagacagt 7740
tttattgttc atgatgatat atttttatct tgtgcaatgt aacatcagag attttgagac 7800
acaacgtggc tttcccccccc cccccattat tgaagcattt atcagggtta ttgtctcatg 7860
agcggataca tatttgaatg tatttagaaa aataaacaaa taggggttcc gcgcacattt 7920
ccccgaaaag tgccacctga cgtctaagaa accattatta tcatgacatt aacctataaa 7980
aataggcgta tcacgaggcc ctttcgtc 8008

<210> 6
<211> 6970
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 6
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680

gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ttctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccatcc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtgagga 3960
tccagatctg ctgtgccttc tagttgccag ccatctgttg tttgcccctc ccccgtgcct 4020
tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca 4080
tcgcattgtc tgagtaggtg tcattctatt ctgggggggtg gggtggggca ggacagcaag 4140
ggggaggatt gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc 4200
caggtgctga agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt 4260
ctctgtgaca caccctgtcc acgccccctgg ttcttagttc cagccccact cataggacac 4320
tcatagctca ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct 4380
ccctccctca tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc 4440
aagataggct attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga 4500
gagaaatcat agaattttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4560
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4620
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4680
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4740
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4800
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4860
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4920
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4980

acccccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 5040
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 5100
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 5160
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 5220
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 5280
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 5340
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5400
cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa gtatatatga 5460
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5520
tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag gtctgcctcg 5580
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5640
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5700
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5760
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5820
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5880
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5940
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 6000
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 6060
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 6120
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 6180
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 6240
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 6300
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6360
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6420
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6480
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6540
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6600
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6660
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6720
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6780
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6840
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6900
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6960
ccctttcgtc 6970

<210> 7
<211> 6787
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 7
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540

tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cttaccgtgc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3480
cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3540
caggcccgca tcctggccgt ggagcgctac ctgaaggacc agcagctgga gcagatctgg 3600
aaccacacca cctggatgga gtgggaccgc gagatcaaca actacaccag cctgatccac 3660
agcctgatcg aggagagcca gaaccagcag gagaagaacg agcaggagct gctggagctg 3720
gacaagtggg ccagcctgtg gaactggttc aacatcacca actggctgtg gtgaggatcc 3780
agatctgctg tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc 3840

ttgaccctgg aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg 3900
cattgtctga gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg 3960
gaggattggg aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag 4020
gtgctgaaga attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc 4080
tgtgacacac cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca 4140
tagctcagga gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc 4200
tccctcatca gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag 4260
ataggctatt aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag 4320
aaatcataga attttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4380
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4440
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4500
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 4560
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4620
ataccaggcg tttcccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4680
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4740
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4800
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4860
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4920
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4980
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 5040
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 5100
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 5160
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 5220
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5280
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5340
atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc tgcctcgtga 5400
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5460
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5520
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5580
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5640
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5700
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5760
ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5820
ccgactcgtc caacatcaat acaacctatt aatttccccc cgtcaaaaat aaggttatca 5880
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5940
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 6000
accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 6060
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 6120
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttcccgggg 6180
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6240
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6300
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6360
tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6420
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6480
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6540
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6600
ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6660
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6720
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6780
tttcgtc 6787

<210> 8
<211> 6607

<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 8
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880

atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cttaccgtgc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3480
cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3540
caggcccgca tcctggccgt ggagcgctac ctgaaggacc agcagctcga gtgaggatcc 3600
agatctgctg tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc 3660
ttgaccctgg aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg 3720
cattgtctga gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg 3780
gaggattggg aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag 3840
gtgctgaaga attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc 3900
tgtgacacac cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca 3960
tagctcagga gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc 4020
tccctcatca gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag 4080
ataggctatt aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag 4140
aaatcataga attttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4200
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4260
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4320
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 4380
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4440
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4500
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4560
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4620
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4680
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4740
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4800
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 4860
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 4920
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 4980
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 5040
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5100
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5160
atttcgttca tccatagttg cctgactccg gggggggggg cgctgaggtc tgcctcgtga 5220
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5280
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5340
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5400
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5460
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5520
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5580
ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5640
ccgactcgtc caacatcaat acaacctatt aatttccccc cgtcaaaaat aaggttatca 5700
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5760
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 5820
accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 5880
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 5940
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttccgggg 6000
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6060
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6120
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6180

tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6240
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6300
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6360
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6420
ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6480
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6540
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6600
tttcgtc 6607

<210> 9
<211> 7042
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 9
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100

accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatctgag gatccagatc tgctgtgcct tctagttgcc agccatctgt tgtttgcccc 4080
tcccccgtgc cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat 4140
gaggaaattg catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg 4200
caggacagca agggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc 4260
tctatgggta cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag 4320
gcacatcccc ttctctgtga cacaccctgt ccacgccccc ggttcttagt tccagcccca 4380
ctcataggac actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt 4440
ggagcggtct ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga 4500
agaaattaaa gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg 4560
aggaagtaat gagagaaatc atagaatttt aaggccatca tggccttaat cttccgcttc 4620
ctcgctcact gactcgctgc gctcggtcgt tcggctgcgg cgagcggtat cagctcactc 4680
aaaggcggta atacggttat ccacagaatc aggggataac gcaggaaaga acatgtgagc 4740
aaaaggccag caaaaggcca ggaaccgtaa aaaggccgcg ttgctggcgt ttttccatag 4800
gctccgcccc cctgacgagc atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc 4860
gacaggacta taaagatacc aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt 4920
tccgaccctg ccgcttaccg gatacctgtc cgcctttctc ccttcgggaa gcgtggcgct 4980
ttctcatagc tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg 5040
ctgtgtgcac gaacccccgg ttcagcccga ccgctgcgcc ttatccggta actatcgtct 5100
tgagtccaac ccggtaagac acgacttatc gccactggca gcagccactg gtaacaggat 5160
tagcagagcg aggtatgtag gcggtgctac agagttcttg aagtggtggc ctaactacgg 5220
ctacactaga agaacagtat ttggtatctg cgctctgctg aagccagtta ccttcggaaa 5280
aagagttggt agctcttgat ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt 5340
ttgcaagcag cagattacgc gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc 5400

tacggggtct gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt 5460
atcaaaaagg atcttcacct agatcctttt aaattaaaaa tgaagtttta aatcaatcta 5520
aagtatatat gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg aggcacctat 5580
ctcagcgatc tgtctatttc gttcatccat agttgcctga ctcgggggggg gggggcgctg 5640
aggtctgcct cgtgaagaag gtgttgctga ctcataccag gcctgaatcg ccccatcatc 5700
cagccagaaa gtgagggagc cacggttgat gagagctttg ttgtaggtgg accagttggt 5760
gattttgaac ttttgctttg ccacggaacg gtctgcgttg tcgggaagat gcgtgatctg 5820
atccttcaac tcagcaaaag ttcgatttat tcaacaaagc cgccgtcccg tcaagtcagc 5880
gtaatgctct gccagtgtta caaccaatta accaattctg attagaaaaa ctcatcgagc 5940
atcaaatgaa actgcaattt attcatatca ggattatcaa taccatattt ttgaaaaagc 6000
cgtttctgta atgaaggaga aaactcaccg aggcagttcc ataggatggc aagatcctgg 6060
tatcggtctg cgattccgac tcgtccaaca tcaatacaac ctattaattt cccctcgtca 6120
aaaataaggt tatcaagtga gaaatcacca tgagtgacga ctgaatccgg tgagaatggc 6180
aaaagcttat gcatttcttt ccagacttgt tcaacaggcc agccattacg ctcgtcatca 6240
aaatcactcg catcaaccaa accgttattc attcgtgatt gcgcctgagc gagacgaaat 6300
acgcgatcgc tgttaaaagg acaattacaa acaggaatcg aatgcaaccg gcgcaggaac 6360
actgccagcg catcaacaat attttcacct gaatcaggat attcttctaa tacctggaat 6420
gctgttttcc cggggatcgc agtggtgagt aaccatgcat catcaggagt acggataaaa 6480
tgcttgatgg tcggaagagg cataaattcc gtcagccagt ttagtctgac catctcatct 6540
gtaacatcat tggcaacgct acctttgcca tgtttcagaa acaactctgg cgcatcgggc 6600
ttcccataca atcgatagat tgtcgcacct gattgcccga cattatcgcg agcccattta 6660
tacccatata aatcagcatc catgttggaa tttaatcgcg gcctcgagca agacgtttcc 6720
cgttgaatat ggctcataac accccttgta ttactgttta tgtaagcaga cagttttatt 6780
gttcatgatg atatatttttt atcttgtgca atgtaacatc agagattttg agacacaacg 6840
tggctttccc ccccccccca ttattgaagc atttatcagg gttattgtct catgagcgga 6900
tacatatttg aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga 6960
aaagtgccac ctgacgtcta agaaaccatt attatcatga cattaaccta taaaaatagg 7020
cgtatcacga ggccctttcg tc 7042

<210> 10
<211> 6859
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 10
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900

agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggccccccac caaggccaag 3420
cttaccgtgc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3480
cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3540
caggcccgca tcctggccgt ggagcgctac ctgaaggacc agcagctgga gcagatctgg 3600
aaccacacca cctggatgga gtgggaccgc gagatcaaca actacaccag cctgatccac 3660
agcctgatcg aggagagcca gaaccagcag gagaagaacg agcaggagct gctggagctg 3720
gacaagtggg ccagcctgtg gaactggttc aacatcacca actggctgtg gtacatcaag 3780
ctgttcatca tgatcgtggg cggcctggtg ggcctgcgca tcgtgttcgc cgtgctgagc 3840
atctgaggat ccagatctgc tgtgccttct agttgccagc catctgttgt ttgcccctcc 3900
cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttcctа ataaaatgag 3960
gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg ggtggggcag 4020
gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct 4080
atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa gaagcaggca 4140
catcccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc agccccactc 4200

ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa agtacttgga 4260
gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag agtgggaaga 4320
aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca acatgtgagg 4380
aagtaatgag agaaatcata gaattttaag gccatcatgg ccttaatctt ccgcttcctc 4440
gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa 4500
ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa 4560
aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct 4620
ccgcccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac 4680
aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc 4740
gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc 4800
tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg 4860
tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga 4920
gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta acaggattag 4980
cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta 5040
cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag 5100
agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg 5160
caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac 5220
ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc 5280
aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag 5340
tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc 5400
agcgatctgt ctatttcgtt catccatagt tgcctgactc gggggggggg ggcgctgagg 5460
tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag 5520
ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat 5580
tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc 5640
cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta 5700
atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc 5760
aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt 5820
ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat 5880
cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa 5940
ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa 6000
agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa 6060
tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg 6120
cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact 6180
gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct 6240
gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc 6300
ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta 6360
acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc 6420
ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac 6480
ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt 6540
tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt 6600
catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg 6660
ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac 6720
atatttgaat gtatttagaa aaataaacaa atagggggttc cgcgcacatt tccccgaaaa 6780
gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt 6840
atcacgaggc cctttcgtc 6859

<210> 11
<211> 6965
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 11
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga acaccatgcg 1920
cgtgaaggag aagtaccagc acctgtggcg ctggggctgg cgctggggca ccatgctgct 1980
gggcatgctg atgatctgca gcgccaccga gaagctgtgg gtgaccgtgt actacggcgt 2040
gcccgtgtgg aaggaggcca ccaccaccct gctctgcgcc agcgacgcca aggcctacga 2100
caccgaggtg cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaaccccca 2160
ggaggtggtg ctggtgaacg tgaccgagaa cttcgacatg tggaagaacg acatggtgga 2220
gcagatgcac gaggacatca tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct 2280
gacccccctg tgcgtgagcc tgaagtgcac cgacctgaag aacgacacca acaccaacag 2340
cagcagcggc cgcatgatca tggagaaggg cgagatcaag aactgcagct tcaacatcag 2400
caccagcatc cgcggcaagg tgcagaagga gtacgccttc ttctacaagc tggacatcat 2460
ccccatcgac aacgacacca ccagctacag cctgaccagc tgcaacacca gcgtgatcac 2520
ccaggcctgc cccaaggtga gcttcgagcc catccccaac cactactgcg cccccgccgg 2580
cttcaccatc ctgaagtgca aggacaagaa gttcaacggc aagggccccc gcaccaacgt 2640
gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg agcacccagc tgctgctgaa 2700
cgaccgcctg gccgaggagg aggtggtgat ccgcagcgcc aacttcgccg acaacgccaa 2760
ggtgatcatc gtgcagctga acgagagcgt ggagatcaac tgcacccgcc ccaacaacaa 2820
cacccgcaag agcatccaca tcggcccccgg ccgcgccttc tacaccaccg gcgagatcat 2880
cggcgacatc cgccaggccc actgcaacct gagccgcgcc aagtggaacg acaccctgaa 2940
caagatcgtg atcaagctgc gcgagcagtt cggcaacaag accatcgtgt tcaagcacag 3000
cagcggcggc gaccccgaga tcgtgaccca cagcttcaac tgcggcggcg agttcttcta 3060
ctgcaacagc acccagctgt tcaacagcac ctggttcaac agcacctgga gcaccgaggg 3120
cagcaacaac accgagggca gcgacaccat caccctgccc tgccgcatca agcagatcat 3180

caacatgtgg cagaaggtgg gcaaggccat gtacgccccc cccatcagcg gccagatccg 3240
ctgcagcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaaca gcaacaacga 3300
gagcgagatc ttccgcctgg gcggcggcga catgcgcgac aactggcgca gcgagctgta 3360
caagtacaag gtggtgaaga tcgagcccct gggcgtggcc cccaccaagg ccaagcgccg 3420
cgtggtgcag cgcgagaagc gcgccgtggg catcggcgcc ctgttcctgg gcttcctggg 3480
cgccgccggc agcaccatgg gcgccgccag catgaccctg accgtgcagg cccgccagct 3540
gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg cccagcagca 3600
cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc tggccgtgga 3660
gcgctacctg aaggaccagc agctgctggg catctggggc tgcagcggca agcttatctg 3720
caccaccgcc gtgccctgga acgccagctg gagcaacaag agcctggagc agatctggaa 3780
ccacaccacc tggatggagt gggaccgcga gatcaacaac tacaccagcc tgatccacag 3840
cctgatcgag gagagccaga accagcagga gaagaacgag caggagctgc tggagctgga 3900
caagtgggcc agcctgtgga actggttcaa catcaccaac tggctgtggt gaggatccag 3960
atctgctgtg ccttctagtt gccagccatc tgttgtttgc ccctcccccg tgccttcctt 4020
gaccctggaa ggtgccactc ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca 4080
ttgtctgagt aggtgtcatt ctattctggg gggtggggtg gggcaggaca gcaaggggga 4140
ggattgggaa gacaatagca ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt 4200
gctgaagaat tgacccggtt cctcctgggc cagaaagaag caggcacatc cccttctctg 4260
tgacacaccc tgtccacgcc cctggttctt agttccagcc ccactcatag gacactcata 4320
gctcaggagg gctccgcctt caatcccacc cgctaaagta cttggagcgg tctctccctc 4380
cctcatcagc ccaccaaacc aaacctagcc tccaagagtg ggaagaaatt aaagcaagat 4440
aggctattaa gtgcagaggg agagaaaatg cctccaacat gtgaggaagt aatgagagaa 4500
atcatagaat tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc 4560
tgcgctcggt cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt 4620
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg 4680
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 4740
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 4800
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 4860
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 4920
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 4980
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 5040
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 5100
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag 5160
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 5220
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 5280
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 5340
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 5400
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 5460
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 5520
ttcgttcatc catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag 5580
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 5640
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 5700
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 5760
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 5820
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 5880
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 5940
agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 6000
gactcgtcca acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag 6060
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 6120
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 6180
caaaccgtta ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa 6240
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 6300
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat 6360
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 6420
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 6480

gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 6540
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 6600
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 6660
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 6720
tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt cccccccccc 6780
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 6840
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 6900
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 6960
tcgtc 6965

<210> 12
<211> 6784
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 12
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040

cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caaccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctggttacg 2700
ggtaacctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg agccgcgcca agtggaacga caccctgaac 2940
aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga ccatcgtgtt caagcacagc 3000
agcggcggcg accccgagat cgtgacccac agcttcaact gcggcggcga gttcttctac 3060
tgcaacagca cccagctgtt caacagcacc tggttcaaca gcacctggag caccgagggc 3120
agcaacaaca ccgagggcag cgacaccatc accctgccct gccgcatcaa gcagatcatc 3180
aacatgtggc agaaggtggg caaggccatg tacgcccccc ccatcagcgg ccagatccgc 3240
tgcagcagca acatcaccgg cctgctgctg acccgcgacg gcggcaacag caacaacgag 3300
agcgagatct tccgcctggg cggcggcgac atgcgcgaca actggcgcag cgagctgtac 3360
aagtacaagg tggtgaagat cgagcccctg ggcgtggccc ccaccaaggc caagcttacc 3420
gtccaggccc gccagctgct gagcggcatc gtgcagcagc agaacaacct gctgcgcgcc 3480
atcgaggccc agcagcacct gctgcagctg accgtgtggg gcatcaagca gctgcaggcc 3540
cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc tgctcgagca gatctggaac 3600
cacaccacct ggatggagtg ggaccgcgag atcaacaact acaccagcct gatccacagc 3660
ctgatcgagg agagccagaa ccagcacgag aagaacgagc aggagctgct ggagctggac 3720
aagtgggcca gcctgtggaa ctggttcaac atcaccaact ggctgtggtg aggatccaga 3780
tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg 3840
accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat 3900
tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag 3960
gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg 4020
ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt 4080
gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag 4140
ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc 4200
ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata 4260
ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa 4320
tcatagaatt ttaaggccat catggcctta atcttccgct tcctcgctca ctgactcgct 4380
gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg taatacggtt 4440
atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc 4500
caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc cccctgacga 4560
gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac tataaagata 4620
ccaggcgttt cccccctggaa gctccctcgt gcgctctcct gttccgaccc tgccgcttac 4680
cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata gctcacgctg 4740
taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc 4800
cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca acccggtaag 4860
acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag cgaggtatgt 4920
aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta gaagaacagt 4980
atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg gtagctcttg 5040
atccggcaaa caaaccaccg ctggtagcgg tggttttttt gtttgcaagc agcagattac 5100
gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt ctgacgctca 5160
gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac 5220
ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat atgagtaaac 5280
ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga tctgtctatt 5340

tcgttcatcc atagttgcct gactcggggg ggggggcgc tgaggtctgc ctcgtgaaga 5400
aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga aagtgaggga 5460
gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga acttttgctt 5520
tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca actcagcaaa 5580
agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct ctgccagtgt 5640
tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg aaactgcaat 5700
ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg taatgaagga 5760
gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc tgcgattccg 5820
actcgtccaa catcaatata acctattaat ttcccctcgt caaaaataag gttatcaagt 5880
gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt atgcatttct 5940
ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact cgcatcaacc 6000
aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc gctgttaaaa 6060
ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag cgcatcaaca 6120
atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt cccggggatc 6180
gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat ggtcggaaga 6240
ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc attggcaacg 6300
ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata caatcgatag 6360
attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata taaatcagca 6420
tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat atggctcata 6480
acaccccttg tattactgtt tatgtaagca gacagtttta ttgttcatga tgatatattt 6540
ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc ccccccccc 6600
cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt 6660
tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc 6720
taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac gaggcccttt 6780
cgtc 6784

<210> 13
<211> 7037
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 13
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080

tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga acaccatgcg 1920
cgtgaaggag aagtaccagc acctgtggcg ctggggctgg cgctggggca ccatgctgct 1980
gggcatgctg atgatctgca gcgccaccga gaagctgtgg gtgaccgtgt actacggcgt 2040
gcccgtgtgg aaggaggcca ccaccaccct gctctgcgcc agcgacgcca aggcctacga 2100
caccgaggtg cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaaccccca 2160
ggaggtggtg ctggtgaacg tgaccgagaa cttcgacatg tggaagaacg acatggtgga 2220
gcagatgcac gaggacatca tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct 2280
gacccccctg tgcgtgagcc tgaagtgcac cgacctgaag aacgacacca acaccaacag 2340
cagcagcggc cgcatgatca tggagaaggg cgagatcaag aactgcagct tcaacatcag 2400
caccagcatc cgcggcaagg tgcagaagga gtacgccttc ttctacaagc tggacatcat 2460
ccccatcgac aacgacacca ccagctacag cctgaccagc tgcaacacca gcgtgatcac 2520
ccaggcctgc cccaaggtga gcttcgagcc catccccaac cactactgcg cccccgccgg 2580
cttcaccatc ctgaagtgca aggacaagaa gttcaacggc aagggcccct gcaccaacgt 2640
gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg agcacccagc tgctgctgaa 2700
cgaccgcctg gccgaggagg aggtggtgat ccgcagcgcc aacttcgccg acaacgccaa 2760
ggtgatcatc gtgcagctga acgagagcgt ggagatcaac tgcacccgcc ccaacaacaa 2820
cacccgcaag agcatccaca tcggccccgg ccgcgccttc tacaccaccg gcgagatcat 2880
cggcgacatc cgccaggccc actgcaacct gagccgcgcc aagtggaacg acaccctgaa 2940
caagatcgtg atcaagctgc gcgagcagtt cggcaacaag accatcgtgt tcaagcacag 3000
cagcggcggc gaccccgaga tcgtgaccca cagcttcaac tgcggcggcg agttcttcta 3060
ctgcaacagc acccagctgt tcaacagcac ctggttcaac agcacctgga gcaccgaggg 3120
cagcaacaac accgagggca gcgacaccat caccctgccc tgccgcatca agcagatcat 3180
caacatgtgg cagaaggtgg gcaaggccat gtacgccccc cccatcagcg gccagatccg 3240
ctgcagcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaaca gcaacaacga 3300
gagcgagatc ttccgcctgg gcggcggcga catgcgcgac aactggcgca gcgagctgta 3360
caagtacaag gtggtgaaga tcgagcccct gggcgtggcc cccaccaagg ccaagcgccg 3420
cgtggtgcag cgcgagaagc gcgccgtggg catcggcgcc ctgttcctgg gcttcctggg 3480
cgccgccggc agcaccatgg gcgccgccag catgaccctg accgtgcagg cccgccagct 3540
gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg cccagcagca 3600
cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc tggccgtgga 3660
gcgctacctg aaggaccagc agctgctggg catctggggc tgcagcggca agcttatctg 3720
caccaccgcc gtgccctgga acgccagctg gagcaacaag agcctggagc agatctggaa 3780
ccacaccacc tggatggagt gggaccgcga gatcaacaac tacaccagcc tgatccacag 3840
cctgatcgag gagagccaga accagcagga gaagaacgag caggagctgc tggagctgga 3900
caagtgggcc agcctgtgga actggttcaa catcaccaac tggctgtggt acatcaagct 3960
gttcatcatg atcgtgggcg gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat 4020
ctgaggatcc agatctgctg tgccttctag ttgccagcca tctgttgttt gcccctcccc 4080
cgtgccttcc ttgaccctgg aaggtgccac tcccactgtc ctttcctaat aaaatgagga 4140
aattgcatcg cattgtctga gtaggtgtca ttctattctg gggggtgggg tggggcagga 4200
cagcaagggg gaggattggg aagacaatag caggcatgct ggggatgcgg tgggctctat 4260
gggtacccag gtgctgaaga attgacccgg ttcctcctgg gccagaaaga agcaggcaca 4320
tccccttctc tgtgacacac cctgtccacg cccctggttc ttagttccag ccccactcat 4380

aggacactca tagctcagga gggctccgcc ttcaatccca cccgctaaag tacttggagc 4440
ggtctctccc tccctcatca gcccaccaaa ccaaacctag cctccaagag tgggaagaaa 4500
ttaaagcaag ataggctatt aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa 4560
gtaatgagag aaatcataga attttaaggc catcatggcc ttaatcttcc gcttcctcgc 4620
tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg 4680
cggtaatacg gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag 4740
gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc 4800
gcccccctga cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag 4860
gactataaag ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga 4920
ccctgccgct taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc 4980
atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg 5040
tgcacgaacc ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt 5100
ccaacccggt aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca 5160
gagcgaggta tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca 5220
ctagaagaac agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag 5280
ttggtagctc ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca 5340
agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg 5400
ggtctgacgc tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa 5460
aaaggatctt cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta 5520
tatatgagta aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag 5580
cgatctgtct atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc 5640
tgcctcgtga agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc 5700
agaaagtgag ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt 5760
tgaacttttg ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct 5820
tcaactcagc aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat 5880
gctctgccag tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa 5940
atgaaactgc aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt 6000
ctgtaatgaa ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg 6060
gtctgcgatt ccgactcgtc caacatcaat acaacctatt aatttccect cgtcaaaaat 6120
aaggttatca agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag 6180
cttatgcatt tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc 6240
actcgcatca accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg 6300
atcgctgtta aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc 6360
cagcgcatca acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt 6420
tttccgggg atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt 6480
gatggtcgga agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac 6540
atcattggca acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc 6600
atacaatcga tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc 6660
atataaatca gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg 6720
aatatggctc ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca 6780
tgatgatata tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct 6840
ttcccccccc ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat 6900
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 6960
gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat 7020
cacgaggccc tttcgtc 7037

<210> 14
<211> 6856
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 14
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctggttacg 2700
ggtaacctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg agccgcgcca agtggaacga caccctgaac 2940
aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga ccatcgtgtt caagcacagc 3000
agcggcggcg accccgagat cgtgacccac agcttcaact gcggcggcga gttcttctac 3060
tgcaacagca cccagctgtt caacagcacc tggttcaaca gcacctggag caccgagggc 3120
agcaacaaca ccgagggcag cgacaccatc accctgccct gccgcatcaa gcagatcatc 3180

aacatgtggc agaaggtggg caaggccatg tacgcccccc ccatcagcgg ccagatccgc 3240
tgcagcagca acatcaccgg cctgctgctg acccgcgacg gcggcaacag caacaacgag 3300
agcgagatct tccgcctggg cggcggcgac atgcgcgaca actggcgcag cgagctgtac 3360
aagtacaagg tggtgaagat cgagcccctg ggcgtggccc ccaccaaggc caagcttacc 3420
gtccaggccc gccagctgct gagcggcatc gtgcagcagc agaacaacct gctgcgcgcc 3480
atcgaggccc agcagcacct gctgcagctg accgtgtggg gcatcaagca gctgcaggcc 3540
cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc tgctcgagca gatctggaac 3600
cacaccacct ggatggagtg ggaccgcgag atcaacaact acaccagcct gatccacagc 3660
ctgatcgagg agagccagaa ccagcacgag aagaacgagc aggagctgct ggagctggac 3720
aagtgggcca gcctgtggaa ctggttcaac atcaccaact ggctgtggta catcaagctg 3780
ttcatcatga tcgtgggcgg cctggtgggc ctgcgcatcg tgttcgccgt gctgagcatc 3840
tgaggatcca gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc 3900
gtgccttcct tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa 3960
attgcatcgc attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac 4020
agcaaggggg aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg 4080
ggtacccagg tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat 4140
ccccttctct gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata 4200
ggacactcat agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg 4260
gtctctccct ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat 4320
taaagcaaga taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag 4380
taatgagaga aatcatagaa ttttaaggcc atcatggcct taatcttccg cttcctcgct 4440
cactgactcg ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc actcaaaggc 4500
ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg 4560
ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgttttтcc ataggctccg 4620
ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg 4680
actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc ctgttccgac 4740
cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca 4800
tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt 4860
gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc 4920
caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag 4980
agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac 5040
tagaagaaca gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaaagagt 5100
tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa 5160
gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg 5220
gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa 5280
aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat 5340
atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc 5400
gatctgtcta tttcgttcat ccatagttgc ctgactcggg gggggggggc gctgaggtct 5460
gcctcgtgaa gaaggtgttg ctgactcata ccaggcctga atcgccccat catccagcca 5520
gaaagtgagg gagccacggt tgatgagagc tttgttgtag gtggaccagt tggtgatttt 5580
gaacttttgc tttgccacgg aacggtctgc gttgtcggga agatgcgtga tctgatcctt 5640
caactcagca aaagttcgat ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg 5700
ctctgccagt gttacaacca attaaccaat tctgattaga aaaactcatc gagcatcaaa 5760
tgaaactgca atttattcat atcaggatta tcaataccat atttttgaaa aagccgtttc 5820
tgtaatgaag gagaaaactc accgaggcag ttccatagga tggcaagatc ctggtatcgg 5880
tctgcgattc cgactcgtcc aacatcaata caacctatta atttcccctc gtcaaaaata 5940
aggttatcaa gtgagaaatc accatgagtg acgactgaat ccggtgagaa tggcaaaagc 6000
ttatgcattt ctttccagac ttgttcaaca ggccagccat tacgctcgtc atcaaaatca 6060
ctcgcatcaa ccaaaccgtt attcattcgt gattgcgcct gagcgagacg aaatacgcga 6120
tcgctgttaa aaggacaatt acaaacagga atcgaatgca accggcgcag gaacactgcc 6180
agcgcatcaa caatattttc acctgaatca ggatattctt ctaatacctg gaatgctgtt 6240
ttcccgggga tcgcagtggt gagtaaccat gcatcatcag gagtacggat aaaatgcttg 6300
atggtcggaa gaggcataaa ttccgtcagc cagtttagtc tgaccatctc atctgtaaca 6360
tcattggcaa cgctaccttt gccatgtttc agaaacaact ctggcgcatc gggcttccca 6420
tacaatcgat agattgtcgc acctgattgc ccgacattat cgcgagccca tttataccca 6480

tataaatcag catccatgtt ggaatttaat cgcggcctcg agcaagacgt ttcccgttga 6540
atatggctca taacacccct tgtattactg tttatgtaag cagacagttt tattgttcat 6600
gatgatatat ttttatcttg tgcaatgtaa catcagagat tttgagacac aacgtggctt 6660
tcccccccc cccattattg aagcatttat cagggttatt gtctcatgag cggatacata 6720
tttgaatgta tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg 6780
ccacctgacg tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc 6840
acgaggccct ttcgtc 6856

<210> 15
<211> 6505
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 15
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag gctagcagcc tgaagtgcac cgacctgaag 2040
aacgacacca acaccaacag cagcagcggc cgcatgatca tggagaaggg cgagatcaag 2100
aactgcagct tcaacatcag caccagcatc cgcggcaagg tgcagaagga gtacgccttc 2160

ttctacaagc tggacatcat ccccatcgac aacgacacca ccagctacag cctgaccagc 2220
tgcaacacca gcgtgatcac ccaggcctgc cccaaggtga gcttcgagcc catccccaac 2280
cactactgcg cccccgccgg cttcgccatc ctgaagtgca aggacaagaa gttcaacggc 2340
aagggcccct gcaccaacgt gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg 2400
agcacccagc tgctgctgaa cggtagcctg gccgaggagg aggtggtgat ccgcagcgct 2460
aacttcgccg acaacgccaa ggtgatcatc gtgcagctga acgagagcgt ggagatcaac 2520
tgcacccgcc ccaacaacaa cacccgcaag agcatccaca tcggcccccgg ccgcgccttc 2580
tacaccaccg gcgagatcat cggcgacatc cgccaggccc actgcaacct gagccgcgcc 2640
aagtggaacg acaccctgaa caagatcgtg atcaagctgc gcgagcagtt cggcaacaag 2700
accatcgtgt tcaagcacag cagcggcggc gaccccgaga tcgtgaccca cagcttcaac 2760
tgcggcggcg agttcttcta ctgcaacagc acccagctgt tcaacagcac ctggttcaac 2820
agcacctgga gcaccgaggg cagcaacaac accgagggca gcgacaccat caccctgccc 2880
tgccgcatca agcagatcat caacatgtgg cagaaggtgg gcaaggccat gtacgccccc 2940
cccatcagcg gccagatccg ctgcagcagc aacatcaccg gcctgctgct gacccgcgac 3000
ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg gcggcggcga catgcgcgac 3060
aactggcgca gcgagctgta caagtacaag gtggtgaaga tcgagccccc gggcgtggcc 3120
cccaccaagg ccaagcttac cgtccaggcc cgccagctgc tgagcggcat cgtgcagcag 3180
cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc tgctgcagct gaccgtgtgg 3240
ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc gctacctgaa ggaccagcag 3300
cagctcgagc agatctggaa ccacaccacc tggatggagt gggaccgcga gatcaacaac 3360
tacaccagcc tgatccacag cctgatcgag gagagccaga accagcagga gaagaacgag 3420
caggagctgc tggagctgga caagtgggcc agcctgtgga actggttcaa catcaccaac 3480
tggctgtggt gaggatccag atctgctgtg ccttctagtt gccagccatc tgttgtttgc 3540
ccctcccccg tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa 3600
aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg gggtggggtg 3660
gggcaggaca gcaaggggga ggattgggaa gacaatagca ggcatgctgg ggatgcggtg 3720
ggctctatgg gtacccaggt gctgaagaat tgacccggtt cctcctgggc cagaaagaag 3780
caggcacatc cccttctctg tgacacaccc tgtccacgcc cctggttctt agttccagcc 3840
ccactcatag gacactcata gctcaggagg gctccgcctt caatcccacc cgctaaagta 3900
cttggagcgg tctctccctc cctcatcagc ccaccaaacc aaacctagcc tccaagagtg 3960
ggaagaaatt aaagcaagat aggctattaa gtgcagaggg agagaaaatg cctccaacat 4020
gtgaggaagt aatgagagaa atcatagaat tttaaggcca tcatggcctt aatcttccgc 4080
ttcctcgctc actgactcgc tgcgctcggt cgttcggctg cggcgagcgg tatcagctca 4140
ctcaaaggcg gtaatacggt tatccacaga atcaggggat aacgcaggaa agaacatgtg 4200
agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca 4260
taggctccgc cccctgacg agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa 4320
cccgacagga ctataaagat accaggcgtt tccccctgga agctccctcg tgcgctctcc 4380
tgttccgacc ctgccgctta ccggatacct gtccgccttt ctcccttcgg gaagcgtggc 4440
gctttctcat agctcacgct gtaggtatct cagttcggtg taggtcgttc gctccaagct 4500
gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc gccttatccg gtaactatcg 4560
tcttgagtcc aacccggtaa gacacgactt atcgccactg gcagcagcca ctggtaacag 4620
gattagcaga gcgaggtatg taggcggtgc tacagagttc ttgaagtggt ggcctaacta 4680
cggctacact agaagaacag tatttggtat ctgcgctctg ctgaagccag ttaccttcgg 4740
aaaaagagtt ggtagctctt gatccggcaa acaaaccacc gctggtagcg gtggtttttt 4800
tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct caagaagatc ctttgatctt 4860
ttctacgggg tctgacgctc agtggaacga aaactcacgt taagggattt tggtcatgag 4920
attatcaaaa aggatcttca cctagatcct tttaaattaa aaatgaagtt ttaaatcaat 4980
ctaaagtata tatgagtaaa cttggtctga cagttaccaa tgcttaatca gtgaggcacc 5040
tatctcagcg atctgtctat ttcgttcatc catagttgcc tgactcgggg gggggggcg 5100
ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac caggcctgaa tcgccccatc 5160
atccagccag aaagtgaggg agccacggtt gatgagagct ttgttgtagg tggaccagtt 5220
ggtgattttg aacttttgct ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat 5280
ctgatccttc aactcagcaa aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc 5340
agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg 5400
agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata tttttgaaaa 5460

agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat ggcaagatcc 5520
tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa tttcccctcg 5580
tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc cggtgagaat 5640
ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt acgctcgtca 5700
tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg agcgagacga 5760
aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg 5820
aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc taatacctgg 5880
aatgctgttt tccccgggat cgcagtggtg agtaaccatg catcatcagg agtacggata 5940
aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct gaccatctca 6000
tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc tggcgcatcg 6060
ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc gcgagcccat 6120
ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga gcaagacgtt 6180
tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc agacagtttt 6240
attgttcatg atgatatatt tttatcttgt gcaatgtaac atcagagatt ttgagacaca 6300
acgtggcttt cccccccccc ccattattga agcatttatc agggttattg tctcatgagc 6360
ggatacatat ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg cacatttccc 6420
cgaaaagtgc cacctgacgt ctaagaaacc attattatca tgacattaac ctataaaaat 6480
aggcgtatca cgaggccctt tcgtc 6505

<210> 16
<211> 6505
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 16
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500

agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccgc tagcatcaac 2520
tgcacccgcc ccaacaacaa cacccgcaag agcatccaca tcggccccgg ccgcgccttc 2580
tacaccaccg gcgagatcat cggcgacatc cgccaggccc actgcaacct gagccgcgcc 2640
aagtggaacg acaccctgaa caagatcgtg atcaagctgc gcgagcagtt cggcaacaag 2700
accatcgtgt tcaagcacag cagcggcggc gaccccgaga tcgtgaccca cagcttcaac 2760
tgcggcggcg agttcttcta ctgcaacagc acccagctgt tcaacagcac ctggttcaac 2820
agcacctgga gcaccgaggg cagcaacaac accgagggca gcgacaccat caccctgccc 2880
tgccgcatca agcagatcat caacatgtgg cagaaggtgg gcaaggccat gtacgccccc 2940
cccatcagcg gccagatccg ctgcagcagc aacatcaccg gcctgctgct gacccgcgac 3000
ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg gcggcggcga catgcgcgac 3060
aactggcgca gcgagctgta caagtacaag gtggtgaaga tcgagcccct gggcgtggcc 3120
cccaccaagg ccaagcttac cgtccaggcc cgccagctgc tgagcggcat cgtgcagcag 3180
cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc tgctgcagct gaccgtgtgg 3240
ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc gctacctgaa ggaccagcag 3300
cagctcgagc agatctggaa ccacaccacc tggatggagt gggaccgcga gatcaacaac 3360
tacaccagcc tgatccacag cctgatcgag gagagccaga accagcagga gaagaacgag 3420
caggagctgc tggagctgga caagtgggcc agcctgtgga actggttcaa catcaccaac 3480
tggctgtggt gaggatccag atctgctgtg ccttctagtt gccagccatc tgttgtttgc 3540
ccctcccccg tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa 3600
aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg gggtggggtg 3660
gggcaggaca gcaaggggga ggattgggaa gacaatagca ggcatgctgg ggatgcggtg 3720
ggctctatgg gtacccaggt gctgaagaat tgacccggtt cctcctgggc cagaaagaag 3780
caggcacatc cccttctctg tgacacaccc tgtccacgcc cctggttctt agttccagcc 3840
ccactcatag gacactcata gctcaggagg gctccgcctt caatcccacc cgctaaagta 3900
cttggagcgg tctctccctc cctcatcagc ccaccaaacc aaacctagcc tccaagagtg 3960
ggaagaaatt aaagcaagat aggctattaa gtgcagaggg agagaaaatg cctccaacat 4020
gtgaggaagt aatgagagaa atcatagaat tttaaggcca tcatggcctt aatcttccgc 4080
ttcctcgctc actgactcgc tgcgctcggt cgttcggctg cggcgagcgg tatcagctca 4140
ctcaaaggcg gtaatacggt tatccacaga atcaggggat aacgcaggaa agaacatgtg 4200
agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca 4260
taggctccgc cccctgacg agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa 4320
cccgacagga ctataaagat accaggcgtt tccccctgga agctccctcg tgcgctctcc 4380
tgttccgacc ctgccgctta ccggatacct gtccgccttt ctcccttcgg gaagcgtggc 4440
gctttctcat agctcacgct gtaggtatct cagttcggtg taggtcgttc gctccaagct 4500
gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc gccttatccg gtaactatcg 4560
tcttgagtcc aacccggtaa gacacgactt atcgccactg gcagcagcca ctggtaacag 4620
gattagcaga gcgaggtatg taggcggtgc tacagagttc ttgaagtggt ggcctaacta 4680
cggctacact agaagaacag tatttggtat ctgcgctctg ctgaagccag ttaccttcgg 4740
aaaaagagtt ggtagctctt gatccggcaa acaaaccacc gctggtagcg gtggtttttt 4800

tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct caagaagatc ctttgatctt 4860
ttctacgggg tctgacgctc agtggaacga aaactcacgt taagggattt tggtcatgag 4920
attatcaaaa aggatcttca cctagatcct tttaaattaa aaatgaagtt ttaaatcaat 4980
ctaaagtata tatgagtaaa cttggtctga cagttaccaa tgcttaatca gtgaggcacc 5040
tatctcagcg atctgtctat ttcgttcatc catagttgcc tgactcgggg gggggggcg 5100
ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac caggcctgaa tcgccccatc 5160
atccagccag aaagtgaggg agccacggtt gatgagagct ttgttgtagg tggaccagtt 5220
ggtgattttg aacttttgct ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat 5280
ctgatccttc aactcagcaa aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc 5340
agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg 5400
agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata tttttgaaaa 5460
agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat ggcaagatcc 5520
tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa tttcccctcg 5580
tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc cggtgagaat 5640
ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt acgctcgtca 5700
tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg agcgagacga 5760
aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg 5820
aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc taatacctgg 5880
aatgctgttt tccccggggat cgcagtggtg agtaaccatg catcatcagg agtacggata 5940
aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct gaccatctca 6000
tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc tggcgcatcg 6060
ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc gcgagcccat 6120
ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga gcaagacgtt 6180
tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc agacagtttt 6240
attgttcatg atgatatatt tttatcttgt gcaatgtaac atcagagatt ttgagacaca 6300
acgtggcttt ccccccccc ccattattga agcatttatc agggttattg tctcatgagc 6360
ggatacatat ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg cacatttccc 6420
cgaaaagtgc cacctgacgt ctaagaaacc attattatca tgacattaac ctataaaaat 6480
aggcgtatca cgaggccctt tcgtc 6505

<210> 17
<211> 6646
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 17
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840

ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg gctagcttct actgcaacag cacccagctg 2940
ttcaacagca cctggttcaa cagcacctgg agcaccgagg gcagcaacaa caccgagggc 3000
agcgacacca tcaccctgcc ctgccgcatc aagcagatca tcaacatgtg gcagaaggtg 3060
ggcaaggcca tgtacgcccc ccccatcagc ggccagatcc gctgcagcag caacatcacc 3120
ggcctgctgc tgacccgcga cggcggcaac agcaacaacg agagcgagat cttccgtccg 3180
ggcggcggcg acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtgaag 3240
atcgagcccc tgggcgtggc ccccaccaag gccaagctta ccgtccaggc ccgccagctg 3300
ctgagcggca tcgtgcagca gcagaacaac ctgctgcgcg ccatcgaggc ccagcagcac 3360
ctgctgcagc tgaccgtgtg gggcatcaag cagctgcagg cccgcaccct ggccgtggag 3420
cgctacctga aggaccagca gcagctcgag cagatctgga accacaccac ctggatggag 3480
tgggaccgcg agatcaacaa ctacaccagc ctgatccaca gcctgatcga ggagagccag 3540
aaccagcagg agaagaacga gcaggagctg ctggagctgg acaagtgggc cagcctgtgg 3600
aactggttca acatcaccaa ctggctgtgg tgaggatcca gatctgctgt gccttctagt 3660
tgccagccat ctgttgtttg cccctcccce gtgccttcct tgaccctgga aggtgccact 3720
cccactgtcc tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat 3780
tctattctgg ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc 3840
aggcatgctg gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt 3900
tcctcctggg ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc 3960
ccctggttct tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct 4020
tcaatcccac ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac 4080
caaacctagc ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg 4140

gagagaaaat gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc 4200
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4260
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4320
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4380
cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca aaaatcgacg 4440
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 4500
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 4560
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 4620
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 4680
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 4740
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 4800
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 4860
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 4920
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 4980
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 5040
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5100
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5160
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5220
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5280
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5340
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5400
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 5460
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 5520
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 5580
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 5640
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 5700
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 5760
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 5820
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 5880
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 5940
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 6000
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6060
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6120
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6180
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6240
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6300
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6360
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6420
catcagagat tttgagacac aacgtggctt tcccccccccc cccattattg aagcatttat 6480
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 6540
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 6600
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6646

<210> 18
<211> 6670
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 18
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60

cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg agccgcgcca agtggaacga caccctgaac 2940
aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga ccatcgtgtt caagcacagc 3000
agcggcggcg accccgagat cgtgacccac agcttcaact gcggcggcga gttcttctac 3060
tgcaacagca cccagctgtt caacagcacc tggttcaaca gcacctggag caccgagggc 3120
agcaacaaca ccgagggcag cgacaccatc accctgccct gccgcatcgc tagcagcaac 3180
aacgagagcg agatcttccg tccgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3240
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3300
cttaccgtcc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3360

cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3420
caggcccgca ccctggccgt ggagcgctac ctgaaggacc agcagcagct cgagcagatc 3480
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3540
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3600
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtgagga 3660
tccagatctg ctgtgccttc tagttgccag ccatctgttg tttgcccctc ccccgtgcct 3720
tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca 3780
tcgcattgtc tgagtaggtg tcattctatt ctgggggggtg gggtggggca ggacagcaag 3840
ggggaggatt gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc 3900
caggtgctga agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt 3960
ctctgtgaca caccctgtcc acgcccctgg ttcttagttc cagccccact cataggacac 4020
tcatagctca ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct 4080
ccctccctca tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc 4140
aagataggct attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga 4200
gagaaatcat agaattttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4260
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4320
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4380
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4440
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4500
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4560
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4620
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4680
acccccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4740
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4800
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4860
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 4920
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 4980
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 5040
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5100
cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa gtatatatga 5160
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5220
tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag gtctgcctcg 5280
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5340
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5400
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5460
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5520
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5580
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5640
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5700
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5760
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5820
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 5880
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 5940
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 6000
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6060
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6120
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6180
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6240
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6300
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6360
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6420
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6480
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6540
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6600
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6660

ccctttcgtc 6670

<210> 19
<211> 6709
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 19
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520

caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg agccgcgcca agtggaacga caccctgaac 2940
aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga ccatcgtgtt caagcacagc 3000
agcggcggcg accccgagat cgtgacccac agcttcaact gcggcggcga gttcttctac 3060
tgcaacagca cccagctgtt caacagcacc tggttcaaca gcacctggag caccgagggc 3120
agcaacaaca ccgagggcag cgacaccatc accctgccct gccgcatcaa gcagatcatc 3180
aacatgtggc agaaggtggg caaggccatg tacgcccccc ccatcagcgg ccagatccgc 3240
tgcagcagca acatcaccgg cctgctgctg acccgcgacg gcggcaacag caacaacgag 3300
agcgagatct tccgtccggg cggcggcgct agcgccaagc ttaccgtcca ggcccgccag 3360
ctgctgagcg gcatcgtgca gcagcagaac aacctgctgc gcgccatcga ggcccagcag 3420
cacctgctgc agctgaccgt gtggggcatc aagcagctgc aggcccgcac cctggccgtg 3480
gagcgctacc tgaaggacca gcagcagctc gagcagatct ggaaccacac cacctggatg 3540
gagtgggacc gcgagatcaa caactacacc agcctgatcc acagcctgat cgaggagagc 3600
cagaaccagc aggagaagaa cgagcaggag ctgctggagc tggacaagtg ggccagcctg 3660
tggaactggt tcaacatcac caactggctg tggtgaggat ccagatctgc tgtgccttct 3720
agttgccagc catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc 3780
actcccactg tcctttccta ataaaatgag gaaattgcat cgcattgtct gagtaggtgt 3840
cattctattc tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat 3900
agcaggcatg ctggggatgc ggtgggctct atgggtaccc aggtgctgaa gaattgaccc 3960
ggttcctcct gggccagaaa gaagcaggca catccccttc tctgtgacac accctgtcca 4020
cgcccctggt tcttagttcc agccccactc ataggacact catagctcag gagggctccg 4080
ccttcaatcc cacccgctaa agtacttgga gcggtctctc cctccctcat cagcccacca 4140
aaccaaacct agcctccaag agtgggaaga aattaaagca agataggcta ttaagtgcag 4200
agggagagaa aatgcctcca acatgtgagg aagtaatgag agaaatcata gaattttaag 4260
gccatcatgg ccttaatctt ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg 4320
gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca cagaatcagg 4380
ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa 4440
ggccgcgttg ctggcgtttt tccataggct ccgccccct gacgagcatc acaaaaatcg 4500
acgctcaagt cagaggtggc gaaacccgac aggactataa agataccagg cgtttccccc 4560
tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg cttaccggat acctgtccgc 4620
ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt atctcagttc 4680
ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa ccccccgttc agcccgaccg 4740
ctgcgcctta tccggtaact atcgtcttga gtccaacccg gtaagacacg acttatcgcc 4800
actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg gtgctacaga 4860
gttcttgaag tggtggccta actacggcta cactagaaga acagtatttg gtatctgcgc 4920
tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg gcaaacaaac 4980
caccgctggt agcggtggtt tttttgtttg caagcagcag attacgcgca gaaaaaaagg 5040
atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagtgga acgaaaactc 5100
acgttaaggg attttggtca tgagattatc aaaaaggatc ttcacctaga tccttttaaa 5160
ttaaaaatga agttttaaat caatctaaag tatatatgag taaacttggt ctgacagtta 5220
ccaatgctta atcagtgagg cacctatctc agcgatctgt ctatttcgtt catccatagt 5280
tgcctgactc ggggggggag ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc 5340
ataccaggcc tgaatcgccc catcatccag ccagaaagtg agggagccac ggttgatgag 5400
agctttgttg taggtggacc agttggtgat tttgaacttt tgctttgcca cggaacggtc 5460
tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca gcaaaagttc gatttattca 5520
acaaagccgc cgtcccgtca agtcagcgta atgctctgcc agtgttacaa ccaattaacc 5580
aattctgatt agaaaaactc atcgagcatc aaatgaaact gcaatttatt catatcagga 5640
ttatcaatac catatttttg aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg 5700
cagttccata ggatggcaag atcctggtat cggtctgcga ttccgactcg tccaacatca 5760
atacaaccta ttaatttccc ctcgtcaaaa ataaggttat caagtgagaa atcaccatga 5820

gtgacgactg aatccggtga gaatggcaaa agcttatgca tttctttcca gacttgttca 5880
acaggccagc cattacgctc gtcatcaaaa tcactcgcat caaccaaacc gttattcatt 5940
cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt taaaaggaca attacaaaca 6000
ggaatcgaat gcaaccggcg caggaacact gccagcgcat caacaatatt ttcacctgaa 6060
tcaggatatt cttctaatac ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac 6120
catgcatcat caggagtacg gataaaatgc ttgatggtcg gaagaggcat aaattccgtc 6180
agccagttta gtctgaccat ctcatctgta acatcattgg caacgctacc tttgccatgt 6240
ttcagaaaca actctggcgc atcgggcttc ccatacaatc gatagattgt cgcacctgat 6300
tgcccgacat tatcgcgagc ccatttatac ccatataaat cagcatccat gttggaattt 6360
aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc tcataacacc ccttgtatta 6420
ctgtttatgt aagcagacag ttttattgtt catgatgata tatttttatc ttgtgcaatg 6480
taacatcaga gattttgaga cacaacgtgg ctttcccccc ccccccatta ttgaagcatt 6540
tatcagggtt attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa 6600
ataggggttc cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt 6660
atcatgacat taacctataa aaataggcgt atcacgaggc cctttcgtc 6709

<210> 20
<211> 6736
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 20
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680

gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 2760
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 2820
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2880
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2940
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 3000
gcaacagcac ccagctgttc aacagcacct ggttcaacag cacctggagc accgagggca 3060
gcaacaacac cgagggcagc gacaccatca ccctgccctg ccgcatcaag cagatcatca 3120
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 3180
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 3240
gcgagatctt ccgtccgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 3300
agtacaaggt ggtgaagatc gagcccctgg gcgtggcccc caccaaggcc aagcttaccg 3360
tccaggcccg ccagctgctg agcggcatcg tgcagcagca gaacaacctg ctgcgcgcca 3420
tcgaggccca gcagcacctg ctgcagctga ccgtgtgggg catcaagcag ctgcaggccc 3480
gcaccctggc cgtggagcgc tacctgaagg accagcagca gctcgagcag atctggaacc 3540
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 3600
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 3660
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtga ggatccagat 3720
ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctcccccgtg ccttccttga 3780
ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 3840
gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc aagggggagg 3900
attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt acccaggtgc 3960
tgaagaattg acccggttcc tcctgggcca gaaagaagca ggcacatccc cttctctgtg 4020
acacaccctg tccacgcccc tggttcttag ttccagcccc actcatagga cactcatagc 4080
tcaggagggc tccgccttca atcccacccg ctaaagtact tggagcggtc tctccctccc 4140
tcatcagccc accaaaccaa acctagcctc caagagtggg aagaaattaa agcaagatag 4200
gctattaagt gcagagggag agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat 4260
catagaattt taaggccatg atttaaggcc atcatggcct taatcttccg cttcctcgct 4320
cactgactcg ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc actcaaaggc 4380
ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg 4440
ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg 4500
ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg 4560
actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc ctgttccgac 4620
cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca 4680
tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt 4740
gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc 4800
caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag 4860
agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac 4920
tagaagaaca gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaaagagt 4980

tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa 5040
gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg 5100
gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa 5160
aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat 5220
atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc 5280
gatctgtcta tttcgttcat ccatagttgc ctgactcggg gggggggggc gctgaggtct 5340
gcctcgtgaa gaaggtgttg ctgactcata ccaggcctga atcgccccat catccagcca 5400
gaaagtgagg gagccacggt tgatgagagc tttgttgtag gtggaccagt tggtgatttt 5460
gaacttttgc tttgccacgg aacggtctgc gttgtcggga agatgcgtga tctgatcctt 5520
caactcagca aaagttcgat ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg 5580
ctctgccagt gttacaacca attaaccaat tctgattaga aaaactcatc gagcatcaaa 5640
tgaaactgca atttattcat atcaggatta tcaataccat atttttgaaa aagccgtttc 5700
tgtaatgaag gagaaaactc accgaggcag ttccatagga tggcaagatc ctggtatcgg 5760
tctgcgattc cgactcgtcc aacatcaata caacctatta atttcccctc gtcaaaaata 5820
aggttatcaa gtgagaaatc accatgagtg acgactgaat ccggtgagaa tggcaaaagc 5880
ttatgcattt ctttccagac ttgttcaaca ggccagccat tacgctcgtc atcaaaatca 5940
ctcgcatcaa ccaaaccgtt attcattcgt gattgcgcct gagcgagacg aaatacgcga 6000
tcgctgttaa aaggacaatt acaaacagga atcgaatgca accggcgcag gaacactgcc 6060
agcgcatcaa caatattttc acctgaatca ggatattctt ctaatacctg gaatgctgtt 6120
ttcccgggga tcgcagtggt gagtaaccat gcatcatcag gagtacggat aaaatgcttg 6180
atggtcggaa gaggcataaa ttccgtcagc cagtttagtc tgaccatctc atctgtaaca 6240
tcattggcaa cgctaccttt gccatgtttc agaaacaact ctggcgcatc gggcttccca 6300
tacaatcgat agattgtcgc acctgattgc ccgacattat cgcgagccca tttataccca 6360
tataaatcag catccatgtt ggaatttaat cgcggcctcg agcaagacgt ttcccgttga 6420
atatggctca taacacccct tgtattactg tttatgtaag cagacagttt tattgttcat 6480
gatgatatat ttttatcttg tgcaatgtaa catcagagat tttgagacac aacgtggctt 6540
tcccccccc cccattattg aagcatttat cagggttatt gtctcatgag cggatacata 6600
tttgaatgta tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg 6660
ccacctgacg tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc 6720
acgaggccct ttcgtc 6736

<210> 21
<211> 6697
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 21
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780

cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgccc caacaacaac acccgcaaga gcatccacat cggccccggc cgcgccttct 2760
acaccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacctg agccgcgcca 2820
agtggaacga caccctgaac aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga 2880
ccatcgtgtt caagcacagc agcggcggcg accccgagat cgtgacccac agcttcaact 2940
gcggcggcga gttcttctac tgcaacagca cccagctgtt caacagcacc tggttcaaca 3000
gcacctggag caccgagggc agcaacaaca ccgagggcag cgacaccatc accctgccct 3060
gccgcatcaa gcagatcatc aacatgtggc agaaggtggg caaggccatg tacgcccccc 3120
ccatcagcgg ccagatccgc tgcagcagca acatcaccgg cctgctgctg acccgcgacg 3180
gcggcaacag caacaacgag agcgagatct tccgtccggg cggcggcgac atgcgcgaca 3240
actggcgcag cgagctgtac aagtacaagg tggtgaagat cgagcccctg ggcgtggccc 3300
ccaccaaggc caagcttacc gtccaggccc gccagctgct gagcggcatc gtgcagcagc 3360
agaacaacct gctgcgcgcc atcgaggccc agcagcacct gctgcagctg accgtgtggg 3420
gcatcaagca gctgcaggcc cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc 3480
agctcgagca gatctggaac cacaccacct ggatggagtg ggaccgcgag atcaacaact 3540
acaccagcct gatccacagc ctgatcgagg agagccagaa ccagcaggag aagaacgagc 3600
aggagctgct ggagctggac aagtgggcca gcctgtggaa ctggttcaac atcaccaact 3660
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3720
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3780
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3840
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3900
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3960
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 4020
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 4080

ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4140
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4200
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4260
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4320
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4380
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4440
ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac gctcaagtca 4500
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4560
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4620
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4680
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4740
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4800
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4860
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4920
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4980
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 5040
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 5100
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5160
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5220
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5280
gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5340
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5400
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5460
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5520
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5580
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5640
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5700
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5760
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5820
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5880
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5940
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 6000
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 6060
tctaatacct ggaatgctgt tttccccggg atcgcagtgg tgagtaacca tgcatcatca 6120
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6180
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6240
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6300
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6360
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6420
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6480
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6540
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6600
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6660
acctataaaa ataggcgtat cacgaggccc tttcgtc 6697

<210> 22
<211> 6712
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 22

tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcaac atcagcacca 2400
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 2460
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 2520
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 2580
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 2640
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2700
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2760
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgcgctagc gcccactgca 2820
acctgagccg cgccaagtgg aacgacaccc tgaacaagat cgtgatcaag ctgcgcgagc 2880
agttcggcaa caagaccatc gtgttcaagc acagcagcgg cggcgacccc gagatcgtga 2940
cccacagctt caactgcggc ggcgagttct tctactgcaa cagcacccag ctgttcaaca 3000
gcacctggtt caacagcacc tggagcaccg agggcagcaa caacaccgag ggcagcgaca 3060
ccatcaccct gccctgccgc atcaagcaga tcatcaacat gtggcagaag gtgggcaagg 3120
ccatgtacgc ccccccatc agcggccaga tccgctgcag cagcaacatc accggcctgc 3180
tgctgacccg cgacggcggc aacagcaaca acgagagcga gatcttccgt ccgggcggcg 3240

gcgacatgcg cgacaactgg cgcagcgagc tgtacaagta caaggtggtg aagatcgagc 3300
ccctgggcgt ggcccccacc aaggccaagc ttaccgtcca ggcccgccag ctgctgagcg 3360
gcatcgtgca gcagcagaac aacctgctgc gcgccatcga ggcccagcag cacctgctgc 3420
agctgaccgt gtggggcatc aagcagctgc aggcccgcac cctggccgtg gagcgctacc 3480
tgaaggacca gcagcagctc gagcagatct ggaaccacac cacctggatg gagtgggacc 3540
gcgagatcaa caactacacc agcctgatcc acagcctgat cgaggagagc cagaaccagc 3600
aggagaagaa cgagcaggag ctgctggagc tggacaagtg ggccagcctg tggaactggt 3660
tcaacatcac caactggctg tggtgaggat ccagatctgc tgtgccttct agttgccagc 3720
catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg 3780
tcctttccta ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc 3840
tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg 3900
ctggggatgc ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct 3960
gggccagaaa gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt 4020
tcttagttcc agccccactc ataggacact catagctcag gagggctccg ccttcaatcc 4080
cacccgctaa agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaaccct 4140
agcctccaag agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa 4200
aatgcctcca acatgtgagg aagtaatgag agaaatcata gaattttaag gccatgattt 4260
aaggccatca tggccttaat cttccgcttc ctcgctcact gactcgctgc gctcggtcgt 4320
tcggctgcgg cgagcggtat cagctcactc aaaggcggta atacggttat ccacagaatc 4380
aggggataac gcaggaaaga acatgtgagc aaaaggccag caaaaggcca ggaaccgtaa 4440
aaaggccgcg ttgctggcgt ttttccatag gctccgcccc cctgacgagc atcacaaaaa 4500
tcgacgctca agtcagaggt ggcgaaaccc gacaggacta taaagatacc aggcgtttcc 4560
ccctggaagc tccctcgtgc gctctcctgt tccgaccctg ccgcttaccg gatacctgtc 4620
cgcctttctc ccttcgggaa gcgtggcgct ttctcatagc tcacgctgta ggtatctcag 4680
ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac gaacccccg ttcagcccga 4740
ccgctgcgcc ttatccggta actatcgtct tgagtccaac ccggtaagac acgacttatc 4800
gccactggca gcagccactg gtaacaggat tagcagagcg aggtatgtag gcggtgctac 4860
agagttcttg aagtggtggc ctaactacgg ctacactaga agaacagtat ttggtatctg 4920
cgctctgctg aagccagtta ccttcggaaa aagagttggt agctcttgat ccggcaaaca 4980
aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag cagattacgc gcagaaaaaa 5040
aggatctcaa gaagatcctt tgatcttttc tacggggtct gacgctcagt ggaacgaaaa 5100
ctcacgttaa gggattttgg tcatgagatt atcaaaaagg atcttcacct agatcctttt 5160
aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaactt ggtctgacag 5220
ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc tgtctatttc gttcatccat 5280
agttgcctga ctcgggggggg gggggcgctg aggtctgcct cgtgaagaag gtgttgctga 5340
ctcataccag gcctgaatcg ccccatcatc cagccagaaa gtgagggagc cacggttgat 5400
gagagctttg ttgtaggtgg accagttggt gattttgaac ttttgctttg ccacggaacg 5460
gtctgcgttg tcgggaagat gcgtgatctg atccttcaac tcagcaaaag ttcgatttat 5520
tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct gccagtgtta caaccaatta 5580
accaattctg attagaaaaa ctcatcgagc atcaaatgaa actgcaattt attcatatca 5640
ggattatcaa taccatattt ttgaaaaagc cgtttctgta atgaaggaga aaactcaccg 5700
aggcagttcc ataggatggc aagatcctgg tatcggtctg cgattccgac tcgtccaaca 5760
tcaatacaac ctattaattt cccctcgtca aaaataaggt tatcaagtga gaaatcacca 5820
tgagtgacga ctgaatccgg tgagaatggc aaaagcttat gcatttcttt ccagacttgt 5880
tcaacaggcc agccattacg ctcgtcatca aaatcactcg catcaaccaa accgttattc 5940
attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc tgttaaaagg acaattacaa 6000
acaggaatcg aatgcaaccg gcgcaggaac actgccagcg catcaacaat attttcacct 6060
gaatcaggat attcttctaa tacctggaat gctgttttcc cggggatcgc agtggtgagt 6120
aaccatgcat catcaggagt acggataaaa tgcttgatgg tcggaagagg cataaattcc 6180
gtcagccagt ttagtctgac catctcatct gtaacatcat tggcaacgct accttttgcca 6240
tgtttcagaa acaactctgg cgcatcgggc ttcccatata atcgatagat tgtcgcacct 6300
gattgcccga cattatcgcg agcccattta tacccatata aatcagcatc catgttggaa 6360
tttaatcgcg gcctcgagca agacgtttcc cgttgaatat ggctcataac acccccttgta 6420
ttactgttta tgtaagcaga cagttttatt gttcatgatg atatattttt atcttgtgca 6480
atgtaacatc agagattttg agacacaacg tggctttccc ccccccccca ttattgaagc 6540

atttatcagg gttattgtct catgagcgga tacatatttg aatgtattta gaaaaataaa 6600
caaatagggg ttccgcgcac atttccccga aaagtgccac ctgacgtcta agaaaccatt 6660
attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg tc 6712

<210> 23
<211> 6715
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 23
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcaac atcagcacca 2400

gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 2460
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 2520
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 2580
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 2640
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2700
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2760
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgccccaac aacaacaccc 2820
gcaagagcat ccacatcggc cccggccgcg ccttctacac caccggcgag atcatcggcg 2880
acatccgcca ggcccactgc aacctgagcc gcgccaagtg gaacgacacc ctgaacaaga 2940
tcgtgatcaa gctgcgcgag cagttcggca acaagaccat cgtgttcaag cacagcagcg 3000
gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc ttctactgca 3060
acagcgctag cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 3120
aggccatgta cgccccccca atcagcggcc agatccgctg cagcagcaac atcaccggcc 3180
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 3240
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 3300
agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 3360
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 3420
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 3480
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 3540
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 3600
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 3660
ggttcaacat caccaactgg ctgtggtgag gatccagatc tgctgtgcct tctagttgcc 3720
agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt gccactccca 3780
ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg tgtcattcta 3840
ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac aatagcaggc 3900
atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga cccggttcct 3960
cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt ccacgccccc 4020
ggttcttagt tccagcccca ctcataggac actcatagct caggagggct ccgccttcaa 4080
tcccacccgc taaagtactt ggagcggtct ctccctccct catcagccca ccaaaccaaa 4140
cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg cagagggaga 4200
gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt aaggccatga 4260
tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc tgcgctcggt 4320
cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt tatccacaga 4380
atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg 4440
taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg agcatcacaa 4500
aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat accaggcgtt 4560
tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta ccggatacct 4620
gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct gtaggtatct 4680
cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc ccgttcagcc 4740
cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa gacacgactt 4800
atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg taggcggtgc 4860
tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag tatttggtat 4920
ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa 4980
acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa 5040
aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc agtggaacga 5100
aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca cctagatcct 5160
tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa cttggtctga 5220
cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat ttcgttcatc 5280
catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag aaggtgttgc 5340
tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg agccacggtt 5400
gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct ttgccacgga 5460
acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa aagttcgatt 5520
tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg ttacaaccaa 5580
ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa tttattcata 5640
tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg agaaaactca 5700

ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc gactcgtcca 5760
acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag tgagaaatca 5820
ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc tttccagact 5880
tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac caaaccgtta 5940
ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa aggacaatta 6000
caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac aatattttca 6060
cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat cgcagtggtg 6120
agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag aggcataaat 6180
tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac gctacctttg 6240
ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata gattgtcgca 6300
cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc atccatgttg 6360
gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat aacacccctt 6420
gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt tttatcttgt 6480
gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc ccattattga 6540
agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat ttagaaaaat 6600
aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt ctaagaaacc 6660
attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt tcgtc 6715

<210> 24
<211> 6619
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 24
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560

agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2640
acacccgcaa gagcatccac atcggccccg gccgcgcctt ctacaccacc ggcgagatca 2700
tcggcgacat ccgccaggcc cactgcaacc tgagccgcgc caagtggaac gacaccctga 2760
acaagatcgt gatcaagctg cgcgagcagt tcggcaacaa gaccatcgtg ttcaagcaca 2820
gcagcggcgg cgaccccgag atcgtgaccc acagcttcaa ctgcggcggc gagttcttct 2880
actgcaacag cacccagctg ttcaacagca cctggttcaa cagcacctgg agcaccgagg 2940
gcagcaacaa caccgagggc agcgacacca tcaccctgcc ctgccgcatc aagcagatca 3000
tcaacatgtg gcagaaggtg ggcaaggcca tgtacgcccc ccccatcagc ggccagatcc 3060
gctgcagcag caacatcacc ggcctgctgc tgacccgcga cggcggcaac agcaacaacg 3120
agagcgagat cttccgtccg ggcggcggcg acatgcgcga caactggcgc agcgagctgt 3180
acaagtacaa ggtggtgaag atcgagcccc tgggcgtggc ccccaccaag gccaagctta 3240
ccgtccaggc ccgccagctg ctgagcggca tcgtgcagca gcagaacaac ctgctgcgcg 3300
ccatcgaggc ccagcagcac ctgctgcagc tgaccgtgtg gggcatcaag cagctgcagg 3360
cccgcaccct ggccgtggag cgctacctga aggaccagca gcagctcgag cagatctgga 3420
accacaccac ctggatggag tgggaccgcg agatcaacaa ctacaccagc ctgatccaca 3480
gcctgatcga ggagagccag aaccagcagg agaagaacga gcaggagctg ctggagctgg 3540
acaagtgggc cagcctgtgg aactggttca acatcaccaa ctggctgtgg tgaggatcca 3600
gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 3660
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3720
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 3780
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 3840
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 3900
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 3960
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 4020
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 4080
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4140
aatcatagaa ttttaaggcc atgatttaag gccatcatgg ccttaatctt ccgcttcctc 4200
gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa 4260
ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa 4320
aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct 4380
ccgccccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac 4440
aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc 4500
gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc 4560
tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg 4620
tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga 4680
gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta acaggattag 4740
cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta 4800
cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag 4860

agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg 4920
caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac 4980
ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc 5040
aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag 5100
tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc 5160
agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggg ggcgctgagg 5220
tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag 5280
ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat 5340
tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc 5400
cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta 5460
atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc 5520
aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt 5580
ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat 5640
cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa 5700
ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa 5760
agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa 5820
tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg 5880
cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact 5940
gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct 6000
gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc 6060
ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta 6120
acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc 6180
ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac 6240
ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt 6300
tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt 6360
catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg 6420
ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac 6480
atatttgaat gtatttagaa aaataaacaa atagggggttc cgcgcacatt tccccgaaaa 6540
gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt 6600
atcacgaggc cctttcgtc 6619

<210> 25
<211> 6655
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 25
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780

cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcgct agcgcccact 2760
gcaacctgag ccgcgccaag tggaacgaca ccctgaacaa gatcgtgatc aagctgcgcg 2820
agcagttcgg caacaagacc atcgtgttca agcacagcag cggcggcgac cccgagatcg 2880
tgacccacag cttcaactgc ggcggcgagt tcttctactg caacagcacc cagctgttca 2940
acagcacctg gttcaacagc acctggagca ccgagggcag caacaacacc gagggcagcg 3000
acaccatcac cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 3060
aggccatgta cgccccccca atcagcggcc agatccgctg cagcagcaac atcaccggcc 3120
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 3180
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 3240
agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 3300
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 3360
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 3420
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 3480
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 3540
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 3600
ggttcaacat caccaactgg ctgtggtgag gatccagatc tgctgtgcct tctagttgcc 3660
agccatctgt tgtttgcccc tccccgtgc cttccttgac cctggaaggt gccactccca 3720
ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg tgtcattcta 3780
ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac aatagcaggc 3840
atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga cccggttcct 3900
cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt ccacgccccc 3960
ggttcttagt tccagcccca ctcataggac actcatagct caggagggct ccgccttcaa 4020
tcccacccgc taaagtactt ggagcggtct ctccctccct catcagccca ccaaaccaaa 4080

cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg cagagggaga 4140
gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt aaggccatga 4200
tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc tgcgctcggt 4260
cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt tatccacaga 4320
atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg 4380
taaaaaggcc gcgttgctgg cgtttttcca taggctccgc ccccctgacg agcatcacaa 4440
aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat accaggcgtt 4500
tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta ccggatacct 4560
gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct gtaggtatct 4620
cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc ccgttcagcc 4680
cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa gacacgactt 4740
atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg taggcggtgc 4800
tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag tatttggtat 4860
ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa 4920
acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa 4980
aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc agtggaacga 5040
aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca cctagatcct 5100
tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa cttggtctga 5160
cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat ttcgttcatc 5220
catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag aaggtgttgc 5280
tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg agccacggtt 5340
gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct ttgccacgga 5400
acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa aagttcgatt 5460
tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg ttacaaccaa 5520
ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa tttattcata 5580
tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg agaaaactca 5640
ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc gactcgtcca 5700
acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag tgagaaatca 5760
ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc tttccagact 5820
tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac caaaccgtta 5880
ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa aggacaatta 5940
caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac aatattttca 6000
cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat cgcagtggtg 6060
agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag aggcataaat 6120
tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac gctacctttg 6180
ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata gattgtcgca 6240
cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc atccatgttg 6300
gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat aacacccctt 6360
gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt tttatcttgt 6420
gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc ccattattga 6480
agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat ttagaaaaat 6540
aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt ctaagaaacc 6600
attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt tcgtc 6655

<210> 26
<211> 6658
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 26

tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt ccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 2760
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 2820
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2880
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2940
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 3000
gcaacagcgc tagcctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 3060
gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 3120
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 3180
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 3240
tcgagccccc gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 3300

tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 3360
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 3420
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 3480
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 3540
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 3600
actggttcaa catcaccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 3660
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3720
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3780
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3840
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3900
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3960
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 4020
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4080
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4140
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4200
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4260
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4320
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4380
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgcccccctg acgagcatca 4440
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4500
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4560
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4620
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4680
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4740
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4800
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4860
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4920
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4980
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5040
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5100
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5160
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5220
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5280
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5340
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5400
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5460
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5520
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5580
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5640
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5700
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5760
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5820
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5880
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5940
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6000
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 6060
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6120
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6180
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6240
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6300
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6360
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6420
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6480
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6540
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6600

accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6658

<210> 27
<211> 6616
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 27
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520

agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgcgc tagcgcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2760
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2820
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 2880
gcaacagcac ccagctgttc aacagcacct ggttcaacag cacctggagc accgagggca 2940
gcaacaacac cgagggcagc gacaccatca ccctgccctg ccgcatcaag cagatcatca 3000
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 3060
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 3120
gcgagatctt ccgtccgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 3180
agtacaaggt ggtgaagatc gagcccctgg gcgtggcccc caccaaggcc aagcttaccg 3240
tccaggcccg ccagctgctg agcggcatcg tgcagcagca gaacaacctg ctgcgcgcca 3300
tcgaggccca gcagcacctg ctgcagctga ccgtgtgggg catcaagcag ctgcaggccc 3360
gcaccctggc cgtggagcgc tacctgaagg accagcagca gctcgagcag atctggaacc 3420
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 3480
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 3540
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtga ggatccagat 3600
ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctccccgtg ccttccttga 3660
ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 3720
gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc aagggggagg 3780
attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt acccaggtgc 3840
tgaagaattg acccggttcc tcctgggcca gaaagaagca ggcacatccc cttctctgtg 3900
acacaccctg tccacgcccc tggttcttag ttccagcccc actcatagga cactcatagc 3960
tcaggagggc tccgccttca atcccacccg ctaaagtact tggagcggtc tctccctccc 4020
tcatcagccc accaaaccaa acctagcctc caagagtggg aagaaattaa agcaagatag 4080
gctattaagt gcagagggag agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat 4140
catagaattt taaggccatg atttaaggcc atcatggcct taatcttccg cttcctcgct 4200
cactgactcg ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc actcaaaggc 4260
ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg 4320
ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg 4380
ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg 4440
actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc ctgttccgac 4500
cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca 4560
tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt 4620
gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc 4680
caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag 4740
agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac 4800
tagaagaaca gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaaagagt 4860
tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa 4920
gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg 4980
gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa 5040
aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat 5100
atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc 5160
gatctgtcta tttcgttcat ccatagttgc ctgactcggg gggggggggc gctgaggtct 5220
gcctcgtgaa gaaggtgttg ctgactcata ccaggcctga atcgccccat catccagcca 5280
gaaagtgagg gagccacggt tgatgagagc tttgttgtag gtggaccagt tggtgatttt 5340
gaacttttgc tttgccacgg aacggtctgc gttgtcggga agatgcgtga tctgatcctt 5400
caactcagca aaagttcgat ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg 5460
ctctgccagt gttacaacca attaaccaat tctgattaga aaaactcatc gagcatcaaa 5520
tgaaactgca atttattcat atcaggatta tcaataccat atttttgaaa aagccgtttc 5580
tgtaatgaag gagaaaactc accgaggcag ttccatagga tggcaagatc ctggtatcgg 5640
tctgcgattc cgactcgtcc aacatcaata caacctatta atttcccctc gtcaaaaata 5700
aggttatcaa gtgagaaatc accatgagtg acgactgaat ccggtgagaa tggcaaaagc 5760
ttatgcattt ctttccagac ttgttcaaca ggccagccat tacgctcgtc atcaaaatca 5820

ctcgcatcaa ccaaaccgtt attcattcgt gattgcgcct gagcgagacg aaatacgcga 5880
tcgctgttaa aaggacaatt acaaacagga atcgaatgca accggcgcag gaacactgcc 5940
agcgcatcaa caatattttc acctgaatca ggatattctt ctaatacctg gaatgctgtt 6000
ttcccgggga tcgcagtggt gagtaaccat gcatcatcag gagtacggat aaaatgcttg 6060
atggtcggaa gaggcataaa ttccgtcagc cagtttagtc tgaccatctc atctgtaaca 6120
tcattggcaa cgctaccttt gccatgtttc agaaacaact ctggcgcatc gggcttccca 6180
tacaatcgat agattgtcgc acctgattgc ccgacattat cgcgagccca tttataccca 6240
tataaatcag catccatgtt ggaatttaat cgcggcctcg agcaagacgt ttcccgttga 6300
atatggctca taacacccct tgtattactg tttatgtaag cagacagttt tattgttcat 6360
gatgatatat ttttatcttg tgcaatgtaa catcagagat tttgagacac aacgtggctt 6420
tccccccccc cccattattg aagcatttat cagggttatt gtctcatgag cggatacata 6480
tttgaatgta tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg 6540
ccacctgacg tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc 6600
acgaggccct ttcgtc 6616

<210> 28
<211> 6619
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 28
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt ccccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgccc caacaacaac acccgcaaga gcatccacat cggccccggc cgcgccttct 2760
acaccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacctg agccgcgcca 2820
agtggaacga caccctgaac aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga 2880
ccatcgtgtt caagcacagc agcggcggcg accccgagat cgtgacccac agcttcaact 2940
gcggcggcga gttcttctac tgcaacagcg ctagcctgcc ctgccgcatc aagcagatca 3000
tcaacatgtg gcagaaggtg ggcaaggcca tgtacgcccc ccccatcagc ggccagatcc 3060
gctgcagcag caacatcacc ggcctgctgc tgacccgcga cggcggcaac agcaacaacg 3120
agagcgagat cttccgtccg ggcggcggcg acatgcgcga caactggcgc agcgagctgt 3180
acaagtacaa ggtggtgaag atcgagcccc tgggcgtggc ccccaccaag gccaagctta 3240
ccgtccaggc ccgccagctg ctgagcggca tcgtgcagca gcagaacaac ctgctgcgcg 3300
ccatcgaggc ccagcagcac ctgctgcagc tgaccgtgtg gggcatcaag cagctgcagg 3360
cccgcaccct ggccgtggag cgctacctga aggaccagca gcagctcgag cagatctgga 3420
accacaccac ctggatggag tgggaccgcg agatcaacaa ctacaccagc ctgatccaca 3480
gcctgatcga ggagagccag aaccagcagg agaagaacga gcaggagctg ctggagctgg 3540
acaagtgggc cagcctgtgg aactggttca acatcaccaa ctggctgtgg tgaggatcca 3600
gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 3660
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3720
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 3780
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 3840
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 3900
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 3960
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 4020
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 4080
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4140
aatcatagaa ttttaaggcc atgatttaag gccatcatgg ccttaatctt ccgcttcctc 4200
gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa 4260
ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa 4320
aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct 4380
ccgccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac 4440
aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc 4500
gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc 4560
tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg 4620
tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga 4680
gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta acaggattag 4740
cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta 4800
cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag 4860
agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg 4920
caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac 4980
ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc 5040

aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag 5100
tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc 5160
agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag ggcgctgagg 5220
tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag 5280
ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat 5340
tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc 5400
cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta 5460
atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc 5520
aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt 5580
ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat 5640
cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa 5700
ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa 5760
agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa 5820
tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg 5880
cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact 5940
gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct 6000
gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc 6060
ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta 6120
acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc 6180
ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac 6240
ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt 6300
tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt 6360
catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg 6420
ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac 6480
atatttgaat gtatttagaa aaataaacaa atagggggttc cgcgcacatt tccccgaaaa 6540
gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt 6600
atcacgaggc cctttcgtc 6619

<210> 29
<211> 6634
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 29
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960

tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcaac atcagcacca 2400
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 2460
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 2520
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 2580
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 2640
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2700
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2760
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgcgctagc gcccactgca 2820
acctgagccg cgccaagtgg aacgacaccc tgaacaagat cgtgatcaag ctgcgcgagc 2880
agttcggcaa caagaccatc gtgttcaagc acagcagcgg cggcgacccc gagatcgtga 2940
cccacagctt caactgcggc ggcgagttct tctactgcaa cagcgctagc ctgccctgcc 3000
gcatcaagca gatcatcaac atgtggcaga aggtgggcaa ggccatgtac gccccccca 3060
tcagcggcca gatccgctgc agcagcaaca tcaccggcct gctgctgacc cgcgacggcg 3120
gcaacagcaa caacgagagc gagatcttcc gtccgggcgg cggcgacatg cgcgacaact 3180
ggcgcagcga gctgtacaag tacaaggtgg tgaagatcga gccccctgggc gtggccccca 3240
ccaaggccaa gcttaccgtc caggcccgcc agctgctgag cggcatcgtg cagcagcaga 3300
acaacctgct gcgcgccatc gaggcccagc agcacctgct gcagctgacc gtgtggggca 3360
tcaagcagct gcaggcccgc accctggccg tggagcgcta cctgaaggac cagcagcagc 3420
tcgagcagat ctggaaccac accacctgga tggagtggga ccgcgagatc aacaactaca 3480
ccagcctgat ccacagcctg atcgaggaga gccagaacca gcaggagaag aacgagcagg 3540
agctgctgga gctggacaag tgggccagcc tgtggaactg gttcaacatc accaactggc 3600
tgtggtgagg atccagatct gctgtgcctt ctagttgcca gccatctgtt gtttgccccct 3660
cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc taataaaatg 3720
aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggggt ggggtggggc 3780
aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat gcggtgggct 3840
ctatgggtac ccaggtgctg aagaattgac ccggttcctc ctgggccaga aagaagcagg 3900
cacatcccct tctctgtgac acaccctgtc cacgcccctg gttcttagtt ccagccccac 3960
tcataggaca ctcatagctc aggagggctc cgccttcaat cccacccgct aaagtacttg 4020
gagcggtctc tccctccctc atcagcccac caaaccaaac ctagcctcca agagtgggaa 4080
gaaattaaag caagataggc tattaagtgc agagggagag aaaatgcctc caacatgtga 4140
ggaagtaatg agagaaatca tagaatttta aggccatgat ttaaggccat catggcctta 4200
atcttccgct tcctcgctca ctgactcgct gcgctcggtc gttcggctgc ggcgagcggt 4260

atcagctcac tcaaaggcgg taatacggtt atccacagaa tcaggggata acgcaggaaa 4320
gaacatgtga gcaaaaggcc agcaaaaggc caggaaccgt aaaaaggccg cgttgctggc 4380
gtttttccat aggctccgcc cccctgacga gcatcacaaa aatcgacgct caagtcagag 4440
gtggcgaaac ccgacaggac tataaagata ccaggcgttt cccccctggaa gctccctcgt 4500
gcgctctcct gttccgaccc tgccgcttac cggatacctg tccgcctttc tcccttcggg 4560
aagcgtggcg ctttctcata gctcacgctg taggtatctc agttcggtgt aggtcgttcg 4620
ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc gaccgctgcg ccttatccgg 4680
taactatcgt cttgagtcca acccggtaag acacgactta tcgccactgg cagcagccac 4740
tggtaacagg attagcagag cgaggtatgt aggcggtgct acagagttct tgaagtggtg 4800
gcctaactac ggctacacta gaagaacagt atttggtatc tgcgctctgc tgaagccagt 4860
taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg ctggtagcgg 4920
tggtttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc aagaagatcc 4980
tttgatcttt tctacggggt ctgacgctca gtggaacgaa aactcacgtt aagggatttt 5040
ggtcatgaga ttatcaaaaa ggatcttcac ctagatcctt ttaaattaaa aatgaagttt 5100
taaatcaatc taaagtatat atgagtaaac ttggtctgac agttaccaat gcttaatcag 5160
tgaggcacct atctcagcga tctgtctatt tcgttcatcc atagttgcct gactcggggg 5220
gggggggcgc tgaggtctgc ctcgtgaaga aggtgttgct gactcatacc aggcctgaat 5280
cgccccatca tccagccaga aagtgaggga gccacggttg atgagagctt tgttgtaggt 5340
ggaccagttg gtgattttga acttttgctt tgccacggaa cggtctgcgt tgtcgggaag 5400
atgcgtgatc tgatccttca actcagcaaa agttcgattt attcaacaaa gccgccgtcc 5460
cgtcaagtca gcgtaatgct ctgccagtgt tacaaccaat taaccaattc tgattagaaa 5520
aactcatcga gcatcaaatg aaactgcaat ttattcatat caggattatc aataccatat 5580
ttttgaaaaa gccgtttctg taatgaagga gaaaactcac cgaggcagtt ccataggatg 5640
gcaagatcct ggtatcggtc tgcgattccg actcgtccaa catcaataca acctattaat 5700
ttcccctcgt caaaaataag gttatcaagt gagaaatcac catgagtgac gactgaatcc 5760
ggtgagaatg gcaaaagctt atgcatttct ttccagactt gttcaacagg ccagccatta 5820
cgctcgtcat caaaatcact cgcatcaacc aaaccgttat tcattcgtga ttgcgcctga 5880
gcgagacgaa atacgcgatc gctgttaaaa ggacaattac aaacaggaat cgaatgcaac 5940
cggcgcagga acactgccag cgcatcaaca atattttcac ctgaatcagg atattcttct 6000
aatacctgga atgctgtttt cccggggatc gcagtggtga gtaaccatgc atcatcagga 6060
gtacggataa aatgcttgat ggtcggaaga ggcataaatt ccgtcagcca gtttagtctg 6120
accatctcat ctgtaacatc attggcaacg ctacctttgc catgtttcag aaacaactct 6180
ggcgcatcgg gcttcccata caatcgatag attgtcgcac ctgattgccc gacattatcg 6240
cgagcccatt tatacccata taaatcagca tccatgttgg aatttaatcg cggcctcgag 6300
caagacgttt cccgttgaat atggctcata acacccctg tattactgtt tatgtaagca 6360
gacagtttta ttgttcatga tgatatattt ttatcttgtg caatgtaaca tcagagattt 6420
tgagacacaa cgtggctttc ccccccccc cattattgaa gcatttatca gggttattgt 6480
ctcatgagcg gatacatatt tgaatgtatt tagaaaaata aacaaatagg ggttccgcgc 6540
acatttcccc gaaaagtgcc acctgacgtc taagaaacca ttattatcat gacattaacc 6600
tataaaaata ggcgtatcac gaggcccttt cgtc 6634

<210> 30
<211> 6538
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 30
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180

accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc gctagcgccc 2640
actgcaacct gagccgcgcc aagtggaacg acaccctgaa caagatcgtg atcaagctgc 2700
gcgagcagtt cggcaacaag accatcgtgt tcaagcacag cagcggcggc gaccccgaga 2760
tcgtgaccca cagcttcaac tgcggcggcg agttcttcta ctgcaacagc acccagctgt 2820
tcaacagcac ctggttcaac agcacctgga gcaccgaggg cagcaacaac accgagggca 2880
gcgacaccat caccctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 2940
gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 3000
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 3060
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 3120
tcgagccccc gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 3180
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 3240
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 3300
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 3360
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 3420
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 3480

actggttcaa catcaccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 3540
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3600
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3660
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3720
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3780
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3840
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 3900
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 3960
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4020
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4080
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4140
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4200
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4260
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgcccccctg acgagcatca 4320
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4380
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4440
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4500
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4560
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4620
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4680
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4740
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4800
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4860
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 4920
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 4980
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5040
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5100
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5160
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5220
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5280
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5340
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5400
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5460
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5520
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5580
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5640
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5700
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5760
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5820
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 5880
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccccgg gatcgcagtg 5940
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6000
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6060
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6120
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6180
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6240
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6300
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6360
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6420
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6480
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6538

<210> 31

<211> 6541
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 31
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatacа acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2640
acacccgcaa gagcatccac atcggccccg gccgcgcctt ctacaccacc ggcgagatca 2700
tcggcgacat ccgccaggcc cactgcaacc tgagccgcgc caagtggaac gacaccctga 2760
acaagatcgt gatcaagctg cgcgagcagt tcggcaacaa gaccatcgtg ttcaagcaca 2820

gcagcggcgg cgaccccgag atcgtgaccc acagcttcaa ctgcggcggc gagttcttct 2880
actgcaacag cgctagcctg ccctgccgca tcaagcagat catcaacatg tggcagaagg 2940
tgggcaaggc catgtacgcc ccccccatca gcggccagat ccgctgcagc agcaacatca 3000
ccggcctgct gctgacccgc gacggcggca acagcaacaa cgagagcgag atcttccgtc 3060
cgggcggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtga 3120
agatcgagcc cctgggcgtg gccccacca aggccaagct taccgtccag gcccgccagc 3180
tgctgagcgg catcgtgcag cagcagaaca acctgctgcg cgccatcgag gcccagcagc 3240
acctgctgca gctgaccgtg tggggcatca agcagctgca ggcccgcacc ctggccgtgg 3300
agcgctacct gaaggaccag cagcagctcg agcagatctg gaaccacacc acctggatgg 3360
agtgggaccg cgagatcaac aactacacca gcctgatcca cagcctgatc gaggagagcc 3420
agaaccagca ggagaagaac gagcaggagc tgctggagct ggacaagtgg gccagcctgt 3480
ggaactggtt caacatcacc aactggctgt ggtgaggatc cagatctgct gtgccttcta 3540
gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg gaaggtgcca 3600
ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg agtaggtgtc 3660
attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg gaagacaata 3720
gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag aattgacccg 3780
gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca ccctgtccac 3840
gcccctggtt cttagttcca gccccactca taggacactc atagctcagg agggctccgc 3900
cttcaatccc acccgctaaa gtacttggag cggtctctcc ctcccctatc agcccaccaa 3960
accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat taagtgcaga 4020
gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag aattttaagg 4080
ccatgattta aggccatcat ggccttaatc ttccgcttcc tcgctcactg actcgctgcg 4140
ctcggtcgtt cggctgcggc gagcggtatc agctcactca aaggcggtaa tacggttatc 4200
cacagaatca ggggataacg caggaaagaa catgtgagca aaaggccagc aaaaggccag 4260
gaaccgtaaa aaggccgcgt tgctggcgtt tttccatagg ctccgccccc ctgacgagca 4320
tcacaaaaat cgacgctcaa gtcagaggtg gcgaaacccg acaggactat aaagatacca 4380
ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg 4440
atacctgtcc gcctttctcc cttcgggaag cgtggcgctt tctcatagct cacgctgtag 4500
gtatctcagt tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt 4560
tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc cggtaagaca 4620
cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga ggtatgtagg 4680
cggtgctaca gagttcttga agtggtggcc taactacggc tacactagaa gaacagtatt 4740
tggtatctgc gctctgctga agccagttac cttcggaaaa agagttggta gctcttgatc 4800
cggcaaacaa accaccgctg gtagcggtgg ttttttttgtt tgcaagcagc agattacgcg 4860
cagaaaaaaa ggatctcaag aagatccttt gatcttttct acggggtctg acgctcagtg 4920
gaacgaaaac tcacgttaag ggattttggt catgagatta tcaaaaagga tcttcaccta 4980
gatcctttta aattaaaaat gaagttttaa atcaatctaa agtatatatg agtaaacttg 5040
gtctgacagt taccaatgct taatcagtga ggcacctatc tcagcgatct gtctatttcg 5100
ttcatccata gttgcctgac tcgggggggg ggggcgctga ggtctgcctc gtgaagaagg 5160
tgttgctgac tcataccagg cctgaatcgc cccatcatcc agccagaaag tgagggagcc 5220
acggttgatg agagctttgt tgtaggtgga ccagttggtg attttgaact tttgctttgc 5280
cacggaacgg tctgcgttgt cgggaagatg cgtgatctga tccttcaact cagcaaaagt 5340
tcgatttatt caacaaagcc gccgtcccgt caagtcagcg taatgctctg ccagtgttac 5400
aaccaattaa ccaattctga ttagaaaaac tcatcgagca tcaaatgaaa ctgcaattta 5460
ttcatatcag gattatcaat accatatttt tgaaaaagcc gtttctgtaa tgaaggagaa 5520
aactcaccga ggcagttcca taggatggca agatcctggt atcggtctgc gattccgact 5580
cgtccaacat caatacaacc tattaatttc ccctcgtcaa aaataaggtt atcaagtgag 5640
aaatcaccat gagtgacgac tgaatccggt gagaatggca aaagcttatg catttctttc 5700
cagacttgtt caacaggcca gccattacgc tcgtcatcaa aatcactcgc atcaaccaaa 5760
ccgttattca ttcgtgattg cgcctgagcg agacgaaata cgcgatcgct gttaaaagga 5820
caattacaaa caggaatcga atgcaaccgg cgcaggaaca ctgccagcgc atcaacaata 5880
ttttcacctg aatcaggata ttcttctaat acctggaatg ctgttttccc ggggatcgca 5940
gtggtgagta accatgcatc atcaggagta cggataaaat gcttgatggt cggaagaggc 6000
ataaattccg tcagccagtt tagtctgacc atctcatctg taacatcatt ggcaacgcta 6060
cctttgccat gtttcagaaa caactctggc gcatcgggct tcccatacaa tcgatagatt 6120

gtcgcacctg attgcccgac attatcgcga gcccatttat acccatataa atcagcatcc 6180
atgttggaat ttaatcgcgg cctcgagcaa gacgtttccc gttgaatatg gctcataaca 6240
ccccttgtat tactgtttat gtaagcagac agttttattg ttcatgatga tatattttta 6300
tcttgtgcaa tgtaacatca gagattttga gacacaacgt ggctttcccc ccccccccat 6360
tattgaagca tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag 6420
aaaaataaac aaataggggt tccgcgcaca tttccccgaa aagtgccacc tgacgtctaa 6480
gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag gccctttcgt 6540
c 6541

<210> 32
<211> 6577
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 32
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100

aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcgct agcgcccact 2760
gcaacctgag ccgcgccaag tggaacgaca ccctgaacaa gatcgtgatc aagctgcgcg 2820
agcagttcgg caacaagacc atcgtgttca agcacagcag cggcggcgac cccgagatcg 2880
tgacccacag cttcaactgc ggcggcgagt tcttctactg caacagcgct agcctgccct 2940
gccgcatcaa gcagatcatc aacatgtggc agaaggtggg caaggccatg tacgcccccc 3000
ccatcagcgg ccagatccgc tgcagcagca acatcaccgg cctgctgctg acccgcgacg 3060
gcggcaacag caacaacgag agcgagatct tccgtccggg cggcggcgac atgcgcgaca 3120
actggcgcag cgagctgtac aagtacaagg tggtgaagat cgagcccctg ggcgtggccc 3180
ccaccaaggc caagcttacc gtccaggccc gccagctgct gagcggcatc gtgcagcagc 3240
agaacaacct gctgcgcgcc atcgaggccc agcagcacct gctgcagctg accgtgtggg 3300
gcatcaagca gctgcaggcc cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc 3360
agctcgagca gatctggaac cacaccacct ggatggagtg ggaccgcgag atcaacaact 3420
acaccagcct gatccacagc ctgatcgagg agagccagaa ccagcaggag aagaacgagc 3480
aggagctgct ggagctggac aagtgggcca gcctgtggaa ctggttcaac atcaccaact 3540
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3600
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3660
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3720
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3780
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3840
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 3900
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 3960
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4020
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4080
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4140
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4200
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4260
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4320
ggcgtttttc cataggctcc gccccctga cgagcatcac aaaaatcgac gctcaagtca 4380
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4440
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4500
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4560
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4620
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4680
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4740
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4800
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4860
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4920
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 4980
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5040
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5100
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5160
ggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5220
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5280
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5340
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5400

tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5460
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5520
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5580
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5640
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5700
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5760
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5820
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5880
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 5940
tctaatacct ggaatgctgt tttccgggg atcgcagtgg tgagtaacca tgcatcatca 6000
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6060
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6120
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6180
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6240
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6300
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6360
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6420
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6480
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6540
acctataaaa ataggcgtat cacgaggccc tttcgtc 6577

<210> 33
<211> 6538
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 33
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380

cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgcgc tagcgcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2760
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2820
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 2880
gcaacagcgc tagcctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 2940
gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 3000
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 3060
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 3120
tcgagccccc gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 3180
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 3240
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 3300
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 3360
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 3420
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 3480
actggttcaa catcaccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 3540
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3600
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3660
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3720
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3780
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3840
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 3900
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 3960
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4020
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4080
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4140
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4200
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4260
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgcccccctg acgagcatca 4320
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4380
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4440
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4500
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4560
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4620
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4680

tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4740
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4800
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4860
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 4920
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 4980
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5040
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5100
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5160
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5220
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5280
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5340
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5400
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5460
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5520
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5580
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5640
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5700
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5760
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5820
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 5880
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 5940
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6000
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6060
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6120
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6180
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6240
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6300
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6360
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6420
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6480
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6538

<210> 34
<211> 6460
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 34
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720

catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc gctagcgccc 2640
actgcaacct gagccgcgcc aagtggaacg acaccctgaa caagatcgtg atcaagctgc 2700
gcgagcagtt cggcaacaag accatcgtgt tcaagcacag cagcggcggc gaccccgaga 2760
tcgtgaccca cagcttcaac tgcggcggcg agttcttcta ctgcaacagc gctagcctgc 2820
cctgccgcat caagcagatc atcaacatgt ggcagaaggt gggcaaggcc atgtacgccc 2880
cccccatcag cggccagatc cgctgcagca gcaacatcac cggcctgctg ctgacccgcg 2940
acggcggcaa cagcaacaac gagagcgaga tcttccgtcc gggcggcggc gacatgcgcg 3000
acaactggcg cagcgagctg tacaagtaca aggtggtgaa gatcgagccc ctgggcgtgg 3060
cccccaccaa ggccaagctt accgtccagg cccgccagct gctgagcggc atcgtgcagc 3120
agcagaacaa cctgctgcgc gccatcgagg cccagcagca cctgctgcag ctgaccgtgt 3180
ggggcatcaa gcagctgcag gcccgcaccc tggccgtgga gcgctacctg aaggaccagc 3240
agcagctcga gcagatctgg aaccacacca cctggatgga gtgggaccgc gagatcaaca 3300
actacaccag cctgatccac agcctgatcg aggagagcca gaaccagcag gagaagaacg 3360
agcaggagct gctggagctg gacaagtggg ccagcctgtg gaactggttc aacatcacca 3420
actggctgtg gtgaggatcc agatctgctg tgccttctag ttgccagcca tctgttgttt 3480
gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac tcccactgtc ctttcctaat 3540
aaaatgagga aattgcatcg cattgtctga gtaggtgtca ttctattctg gggggtgggg 3600
tggggcagga cagcaagggg gaggattggg aagacaatag caggcatgct ggggatgcgg 3660
tgggctctat gggtacccag gtgctgaaga attgacccgg ttcctcctgg gccagaaaga 3720
agcaggcaca tccccttctc tgtgacacac cctgtccacg cccctggttc ttagttccag 3780
ccccactcat aggacactca tagctcagga gggctccgcc ttcaatccca cccgctaaag 3840
tacttggagc ggtctctccc tccctcatca gcccaccaaa ccaaacctag cctccaagag 3900
tgggaagaaa ttaaagcaag ataggctatt aagtgcagag ggagagaaaa tgcctccaac 3960
atgtgaggaa gtaatgagag aaatcataga attttaaggc catgatttaa ggccatcatg 4020

gccttaatct tccgcttcct cgctcactga ctcgctgcgc tcggtcgttc ggctgcggcg 4080
agcggtatca gctcactcaa aggcggtaat acggttatcc acagaatcag gggataacgc 4140
aggaaagaac atgtgagcaa aaggccagca aaaggccagg aaccgtaaaa aggccgcgtt 4200
gctggcgttt ttccataggc tccgcccccc tgacgagcat cacaaaaatc gacgctcaag 4260
tcagaggtgg cgaaacccga caggactata aagataccag gcgtttcccc ctggaagctc 4320
cctcgtgcgc tctcctgttc cgaccctgcc gcttaccgga tacctgtccg cctttctccc 4380
ttcgggaagc gtggcgcttt ctcatagctc acgctgtagg tatctcagtt cggtgtaggt 4440
cgttcgctcc aagctgggct gtgtgcacga acccccccgtt cagcccgacc gctgcgcctt 4500
atccggtaac tatcgtcttg agtccaaccc ggtaagacac gacttatcgc cactggcagc 4560
agccactggt aacaggatta gcagagcgag gtatgtaggc ggtgctacag agttcttgaa 4620
gtggtggcct aactacggct acactagaag aacagtattt ggtatctgcg ctctgctgaa 4680
gccagttacc ttcggaaaaa gagttggtag ctcttgatcc ggcaaacaaa ccaccgctgg 4740
tagcggtggt ttttttgttt gcaagcagca gattacgcgc agaaaaaaag gatctcaaga 4800
agatcctttg atcttttcta cggggtctga cgctcagtgg aacgaaaact cacgttaagg 4860
gattttggtc atgagattat caaaaaggat cttcacctag atccttttaa attaaaaatg 4920
aagttttaaa tcaatctaaa gtatatatga gtaaacttgg tctgacagtt accaatgctt 4980
aatcagtgag gcacctatct cagcgatctg tctatttcgt tcatccatag ttgcctgact 5040
cgggggggggg gggcgctgag gtctgcctcg tgaagaaggt gttgctgact cataccaggc 5100
ctgaatcgcc ccatcatcca gccagaaagt gagggagcca cggttgatga gagctttgtt 5160
gtaggtggac cagttggtga ttttgaactt ttgctttgcc acggaacggt ctgcgttgtc 5220
gggaagatgc gtgatctgat ccttcaactc agcaaaagtt cgatttattc aacaaagccg 5280
ccgtcccgtc aagtcagcgt aatgctctgc cagtgttaca accaattaac caattctgat 5340
tagaaaaact catcgagcat caaatgaaac tgcaatttat tcatatcagg attatcaata 5400
ccatattttt gaaaaagccg tttctgtaat gaaggagaaa actcaccgag gcagttccat 5460
aggatggcaa gatcctggta tcggtctgcg attccgactc gtccaacatc aatacaacct 5520
attaatttcc cctcgtcaaa aataaggtta tcaagtgaga aatcaccatg agtgacgact 5580
gaatccggtg agaatggcaa aagcttatgc atttctttcc agacttgttc aacaggccag 5640
ccattacgct cgtcatcaaa atcactcgca tcaaccaaac cgttattcat tcgtgattgc 5700
gcctgagcga gacgaaatac gcgatcgctg ttaaaaggac aattacaaac aggaatcgaa 5760
tgcaaccggc gcaggaacac tgccagcgca tcaacaatat tttcacctga atcaggatat 5820
tcttctaata cctggaatgc tgttttcccg gggatcgcag tggtgagtaa ccatgcatca 5880
tcaggagtac ggataaaatg cttgatggtc ggaagaggca taaattccgt cagccagttt 5940
agtctgacca tctcatctgt aacatcattg gcaacgctac ctttgccatg tttcagaaac 6000
aactctggcg catcgggctt cccatacaat cgatagattg tcgcacctga ttgcccgaca 6060
ttatcgcgag cccatttata cccatataaa tcagcatcca tgttggaatt taatcgcggc 6120
ctcgagcaag acgtttcccg ttgaatatgg ctcataacac cccttgtatt actgtttatg 6180
taagcagaca gttttattgt tcatgatgat atatttttat cttgtgcaat gtaacatcag 6240
agattttgag acacaacgtg gctttccccc ccccccccatt attgaagcat ttatcagggt 6300
tattgtctca tgagcggata catatttgaa tgtatttaga aaaataaaca aatagggggtt 6360
ccgcgcacat ttccccgaaa agtgccacct gacgtctaag aaaccattat tatcatgaca 6420
ttaacctata aaaataggcg tatcacgagg ccctttcgtc 6460

<210> 35
<211> 7987
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 35
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggtt ggagtttgtg acgtggcgcg gggcgtggga 120

acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaagaactg cagcttcaac atcagcacca 1740
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 1800
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 1860
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 1920
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 1980
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2040
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2100
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgccccaac aacaacaccc 2160
gcaagagcat ccacatcggc cccggccgcg ccttctacac caccggcgag atcatcggcg 2220
acatccgcca ggcccactgc aacctgagcc gcgccaagtg gaacgacacc ctgaacaaga 2280
tcgtgatcaa gctgcgcgag cagttcggca acaagaccat cgtgttcaag cacagcagcg 2340
gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc ttctactgca 2400
acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc gagggcagca 2460
acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag atcatcaaca 2520
tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag atccgctgca 2580
gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac aacgagagcg 2640
agatcttccg tccgggcggc ggcgacatgc gcgacaactg gcgcagcgag ctgtacaagt 2700
acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag cttaccgtcc 2760
aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg cgcgccatcg 2820
aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg caggcccgca 2880
ccctggccgt ggagcgctac ctgaaggacc agcagcagct cgagcagatc tggaaccaca 2940
ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc cacagcctga 3000
tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag ctggacaagt 3060
gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtgagga tccagatctg 3120
ctgtgccttc tagttgccag ccatctgttg tttgccccctc ccccgtgcct tccttgaccc 3180
tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca tcgcattgtc 3240
tgagtaggtg tcattctatt ctgggggggtg gggtggggca gcacagcaag ggggaggatt 3300
gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc cagggccgca 3360
taacttcgta taatgtatgc tatacgaagt tataagatct gtactgaaat gtgtgggcgt 3420

ggcttaaggg tgggaaagaa tatataaggt gggggtctta tgtagttttg tatctgtttt 3480
gcagcagccg ccgccgccat gagcaccaac tcgtttgatg gaagcattgt gagctcatat 3540
ttgacaacgc gcatgccccc atgggccggg gtgcgtcaga atgtgatggg ctccagcatt 3600
gatggtcgcc ccgtcctgcc cgcaaactct actaccttga cctacgagac cgtgtctgga 3660
acgccgttgg agactgcagc ctccgccgcc gcttcagccg ctgcagccac cgcccgcggg 3720
attgtgactg actttgcttt cctgagcccg cttgcaagca gtgcagcttc ccgttcatcc 3780
gcccgcgatg acaagttgac ggctcttttg gcacaattgg attctttgac ccgggaactt 3840
aatgtcgttt ctcagcagct gttggatctg cgccagcagg tttctgccct gaaggcttcc 3900
tcccctccca atgcggttta aaacataaat aaaaaaccag actctgtttg gatttggatc 3960
aagcaagtgt cttgctgtct ttatttaggg gttttgcgcg cgcggtaggc ccgggaccag 4020
cggtctcggt cgttgagggt cctgtgtatt ttttccagga cgtggtaaag gtgactctgg 4080
atgttcagat acatgggcat aagcccgtct ctggggtgga ggtagcacca ctgcagagct 4140
tcatgctgcg gggtggtgtt gtagatgatc cagtcgtagc aggagcgctg ggcgtggtgc 4200
ctaaaaatgt ctttcagtag caagctgatt gccaggggca ggcccttggt gtaagtgttt 4260
acaaagcggt taagctggga tgggtgcata cgtggggata tgagatgcat cttggactgt 4320
atttttaggt tggctatgtt cccagccata tccctccggg gattcatgtt gtgcagaacc 4380
accagcacag tgtatccggt gcacttggga aatttgtcat gtagcttaga aggaaatgcg 4440
tggaagaact tggagacgcc cttgtgacct ccaagatttt ccatgcattc gtccataatg 4500
atggcaatgg gcccacgggc ggcggcctgg gcgaagatat ttctgggatc actaacgtca 4560
tagttgtgtt ccaggatgag atcgtcatag gccatttta caaagcgcgg gcggagggtg 4620
ccagactgcg gtataatggt tccatccggc ccaggggcgt agttaccctc acagatttgc 4680
atttcccacg ctttgagttc agatgggggg atcatgtcta cctgcggggc gatgaagaaa 4740
acggtttccg gggtagggga gatcagctgg gaagaaagca ggttcctgag cagctgcgac 4800
ttaccgcagc cggtgggccc gtaaatcaca cctattaccg gctgcaactg gtagttaaga 4860
gagctgcagc tgccgtcatc cctgagcagg ggggccactt cgttaagcat gtccctgact 4920
cgcatgtttt ccctgaccaa atccgccaga aggcgctcgc cgcccagcga tagcagttct 4980
tgcaaggaag caaagttttt caacggtttg agaccgtccg ccgtaggcat gcttttgagc 5040
gtttgaccaa gcagttccag gcggtcccac agctcggtca cctgctctac ggcatctcga 5100
tccagcatat ctcctcgttt cgcgggttgg ggcggctttc gctgtacggc agtagtcggt 5160
gctcgtccag acgggccagg gtcatgtctt tccacgggcg cagggtcctc gtcagcgtag 5220
tctgggtcac ggtgaagggg tgcgctccgg gctgcgcgct ggccagggtg cgcttgaggc 5280
tggtcctgct ggtgctgaag cgctgccggt cttcgccctg cgcgtcggcc aggtagcatt 5340
tgaccatggt gtcatagtcc agcccctccg cggcgtggcc cttggcgcgc agcttgccct 5400
tggaggaggc gccgcacgag gggcagtgca gacttttgag ggcgtagagc ttgggcgcga 5460
gaaataccga ttccggggag taggcatccg cgccgcaggc cccgcagacg gtctcgcatt 5520
ccacgagcca ggtgagctct ggccgttcgg ggtcaaaaac caggtttccc ccatgctttt 5580
tgatgcgttt cttacctctg gtttccatga gccggtgtcc acgctcggtg acgaaaaggc 5640
tgtccgtgtc cccgtataca gacttgagag gcctgtcctc gagcggtgtt ccgcggtcct 5700
cctcgtatag aaactcggac cactctgaga caaaggctcg cgtccaggcc agcacgaagg 5760
aggctaagtg ggaggggtag cggtcgttgt ccactagggg gtccactcgc tccagggtgt 5820
gaagacacat gtcgccctct tcggcatcaa ggaaggtgat tggtttgtag gtgtaggcca 5880
cgtgaccggg tgttcctgaa gggggggctat aaaaggggtg gggggcgcgt tcgtcctcac 5940
tctcttccgc atcgctgtct gcgagggcca gctgttgggg tgagtcgacg cgaggctgga 6000
tggccttccc cattatgatt cttctcgctt ccggcggcat cgggatgccc gcgttgcagg 6060
ccatgctgtc caggcaggta gatgacgacc atcagggaca gcttcaaggc cagcaaaagg 6120
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 6180
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 6240
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 6300
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 6360
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 6420
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 6480
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 6540
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaaggacag 6600
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 6660
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 6720

cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 6780
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 6840
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 6900
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 6960
ttcgttcatc catagttgcc tgactccccg tcgtgtagat aactacgata cgggagggct 7020
taccatctgg ccccagtgct gcaatgatac cgcgagaccc acgctcaccg gctccagatt 7080
tatcagcaat aaaccagcca gccggaaggg ccgagcgcag aagtggtcct gcaactttat 7140
ccgcctccat ccagtctatt aattgttgcc gggaagctag agtaagtagt tcgccagtta 7200
atagtttgcg caacgttgtt gccattgctg caggcatcgt ggtgtcacgc tcgtcgtttg 7260
gtatggcttc attcagctcc ggttcccaac gatcaaggcg agttacatga tcccccatgt 7320
tgtgcaaaaa agcggttagc tccttcggtc ctccgatcgt tgtcagaagt aagttggccg 7380
cagtgttatc actcatggtt atggcagcac tgcataattc tcttactgtc atgccatccg 7440
taagatgctt ttctgtgact ggtgagtact caaccaagtc attctgagaa tagtgtatgc 7500
ggcgaccgag ttgctcttgc ccggcgtcaa cacgggataa taccgcgcca catagcagaa 7560
ctttaaaagt gctcatcatt ggaaaacgtt cttcggggcg aaaactctca aggatcttac 7620
cgctgttgag atccagttcg atgtaaccca ctcgtgcacc caactgatct tcagcatctt 7680
ttactttcac cagcgtttct gggtgagcaa aaacaggaag gcaaaatgcc gcaaaaaagg 7740
gaataagggc gacacggaaa tgttgaatac tcatactctt cctttttcaa tattattgaa 7800
gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata 7860
aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc taagaaacca 7920
ttattatcat gacattaacc tataaaaata ggcgtatcac gaggcccttt cgtcttcaag 7980
aattgtt 7987

<210> 36
<211> 7948
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 36
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260

cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcgctagc accagctgca 1800
acaccagcgt gatcacccag gcctgcccca aggtgagctt cgagcccatc cccaaccact 1860
actgcgcccc cgccggcttc gccatcctga agtgcaagga caagaagttc aacggcaagg 1920
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 1980
cccagctgct gctgaacggt agcctggccg aggaggaggt ggtgatccgc agcgctaact 2040
tcgccgacaa cgccaaggtg atcatcgtgc agctgaacga gagcgtggag atcaactgca 2100
cccgccccaa caacaacacc cgcaagagca tccacatcgg ccccggccgc gccttctaca 2160
ccaccggcga gatcatcggc gacatccgcc aggcccactg caacctgagc cgcgccaagt 2220
ggaacgacac cctgaacaag atcgtgatca agctgcgcga gcagttcggc aacaagacca 2280
tcgtgttcaa gcacagcagc ggcggcgacc ccgagatcgt gacccacagc ttcaactgcg 2340
gcggcgagtt cttctactgc aacagcaccc agctgttcaa cagcacctgg ttcaacagca 2400
cctggagcac cgagggcagc aacaacaccg agggcagcga caccatcacc ctgccctgcc 2460
gcatcaagca gatcatcaac atgtggcaga aggtgggcaa ggccatgtac gccccccca 2520
tcagcggcca gatccgctgc agcagcaaca tcaccggcct gctgctgacc cgcgacggcg 2580
gcaacagcaa caacgagagc gagatcttcc gtccgggcgg cggcgacatg cgcgacaact 2640
ggcgcagcga gctgtacaag tacaaggtgg tgaagatcga gcccctgggc gtggcccca 2700
ccaaggccaa gcttaccgtc caggcccgcc agctgctgag cggcatcgtg cagcagcaga 2760
acaacctgct gcgcgccatc gaggcccagc agcacctgct gcagctgacc gtgtggggca 2820
tcaagcagct gcaggcccgc accctggccg tggagcgcta cctgaaggac cagcagcagc 2880
tcgagcagat ctggaaccac accacctgga tggagtggga ccgcgagatc aacaactaca 2940
ccagcctgat ccacagcctg atcgaggaga gccagaacca gcaggagaag aacgagcagg 3000
agctgctgga gctggacaag tgggccagcc tgtggaactg gttcaacatc accaactggc 3060
tgtggtgagg atccagatct gctgtgcctt ctagttgcca gccatctgtt gtttgccct 3120
cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc taataaaatg 3180
aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggt ggggtggggc 3240
agcacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat gcggtgggct 3300
ctatgggtac ccagggccgc ataacttcgt ataatgtatg ctatacgaag ttataagatc 3360
tgtactgaaa tgtgtgggcg tggcttaagg gtgggaaaga atatataagg tgggggtctt 3420
atgtagtttt gtatctgttt tgcagcagcc gccgccgcca tgagcaccaa ctcgtttgat 3480
ggaagcattg tgagctcata tttgacaacg cgcatgcccc catgggccgg ggtgcgtcag 3540
aatgtgatgg gctccagcat tgatggtcgc cccgtcctgc ccgcaaactc tactaccttg 3600
acctacgaga ccgtgtctgg aacgccgttg gagactgcag cctccgccgc cgcttcagcc 3660
gctgcagcca ccgcccgcgg gattgtgact gactttgctt tcctgagccc gcttgcaagc 3720
agtgcagctt cccgttcatc cgcccgcgat gacaagttga cggctctttt ggcacaattg 3780
gattctttga cccgggaact taatgtcgtt tctcagcagc tgttggatct gcgccagcag 3840
gtttctgccc tgaaggcttc ctcccctccc aatgcggttt aaaacataaa taaaaaacca 3900
gactctgttt ggatttggat caagcaagtg tcttgctgtc tttatttagg ggttttgcgc 3960
gcgcggtagg cccgggacca gcggtctcgg tcgttgaggg tcctgtgtat tttttccagg 4020
acgtggtaaa ggtgactctg gatgttcaga tacatgggca taagcccgtc tctggggtgg 4080
aggtagcacc actgcagagc ttcatgctgc ggggtggtgt tgtagatgat ccagtcgtag 4140
caggagcgct gggcgtggtg cctaaaaatg tctttcagta gcaagctgat tgccaggggc 4200
aggcccttgg tgtaagtgtt tacaaagcgg ttaagctggg atgggtgcat acgtggggat 4260
atgagatgca tcttggactg tatttttagg ttggctatgt tcccagccat atcccttcgg 4320
ggattcatgt tgtgcagaac caccagcaca gtgtatccgg tgcacttggg aaatttgtca 4380
tgtagcttag aaggaaatgc gtggaagaac ttggagacgc ccttgtgacc tccaagattt 4440
tccatgcatt cgtccataat gatggcaatg ggcccacggg cggcggcctg ggcgaagata 4500
tttctgggat cactaacgtc atagttgtgt tccaggatga gatcgtcata ggccattttt 4560

acaaagcgcg ggcggagggt gccagactgc ggtataatgg ttccatccgg cccaggggcg 4620
tagttaccct cacagatttg catttcccac gctttgagtt cagatggggg gatcatgtct 4680
acctgcgggg cgatgaagaa aacggtttcc ggggtagggg agatcagctg ggaagaaagc 4740
aggttcctga gcagctgcga cttaccgcag ccggtgggcc cgtaaatcac acctattacc 4800
ggctgcaact ggtagttaag agagctgcag ctgccgtcat ccctgagcag gggggccact 4860
tcgttaagca tgtccctgac tcgcatgttt tccctgacca aatccgccag aaggcgctcg 4920
ccgcccagcg atagcagttc ttgcaaggaa gcaaagtttt tcaacggttt gagaccgtcc 4980
gccgtaggca tgcttttgag cgtttgacca agcagttcca ggcggtccca cagctcggtc 5040
acctgctcta cggcatctcg atccagcata tctcctcgtt tcgcgggttg gggcggcttt 5100
cgctgtacgg cagtagtcgg tgctcgtcca gacgggccag ggtcatgtct ttccacgggc 5160
gcagggtcct cgtcagcgta gtctgggtca cggtgaaggg gtgcgctccg ggctgcgcgc 5220
tggccagggt gcgcttgagg ctggtcctgc tggtgctgaa gcgctgccgg tcttcgccct 5280
gcgcgtcggc caggtagcat ttgaccatgg tgtcatagtc cagcccctcc gcggcgtggc 5340
ccttggcgcg cagcttgccc ttggaggagg cgccgcacga ggggcagtgc agacttttga 5400
gggcgtagag cttgggcgcg agaaataccg attccgggga gtaggcatcc gcgccgcagg 5460
ccccgcagac ggtctcgcat tccacgagcc aggtgagctc tggccgttcg gggtcaaaaa 5520
ccaggtttcc cccatgcttt ttgatgcgtt tcttacctct ggtttccatg agccggtgtc 5580
cacgctcggt gacgaaaagg ctgtccgtgt ccccgtatac agacttgaga ggcctgtcct 5640
cgagcggtgt tccgcggtcc tcctcgtata gaaactcgga ccactctgag acaaaggctc 5700
gcgtccaggc cagcacgaag gaggctaagt gggaggggta gcggtcgttg tccactaggg 5760
ggtccactcg ctccagggtg tgaagacaca tgtcgccctc ttcggcatca aggaaggtga 5820
ttggtttgta ggtgtaggcc acgtgaccgg gtgttcctga agggggggcta taaaaggggg 5880
tgggggcgcg ttcgtcctca ctctcttccg catcgctgtc tgcgagggcc agctgttggg 5940
gtgagtcgac gcgaggctgg atggccttcc ccattatgat tcttctcgct tccggcggca 6000
tcgggatgcc cgcgttgcag gccatgctgt ccaggcaggt agatgacgac catcagggac 6060
agcttcaagg ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc 6120
ataggctccg ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa 6180
acccgacagg actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc 6240
ctgttccgac cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg 6300
cgctttctca tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc 6360
tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc 6420
gtcttgagtc caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca 6480
ggattagcag agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact 6540
acggctacac tagaaggaca gtatttggta tctgcgctct gctgaagcca gttaccttcg 6600
gaaaaagagt tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt 6660
ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct 6720
tttctacggg gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga 6780
gattatcaaa aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa 6840
tctaaagtat atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac 6900
ctatctcagc gatctgtcta tttcgttcat ccatagttgc ctgactcccc gtcgtgtaga 6960
taactacgat acgggagggc ttaccatctg gccccagtgc tgcaatgata ccgcgagacc 7020
cacgctcacc ggctccagat ttatcagcaa taaaccagcc agccggaagg gccgagcgca 7080
gaagtggtcc tgcaacttta tccgcctcca tccagtctat taattgttgc cgggaagcta 7140
gagtaagtag ttcgccagtt aatagtttgc gcaacgttgt tgccattgct gcaggcatcg 7200
tggtgtcacg ctcgtcgttt ggtatggctt cattcagctc cggttcccaa cgatcaaggc 7260
gagttacatg atcccccatg ttgtgcaaaa aagcggttag ctccttcggt cctccgatcg 7320
ttgtcagaag taagttggcc gcagtgttat cactcatggt tatggcagca ctgcataatt 7380
ctcttactgt catgccatcc gtaagatgct tttctgtgac tggtgagtac tcaaccaagt 7440
cattctgaga atagtgtatg cggcgaccga gttgctcttg cccggcgtca acacgggata 7500
ataccgcgcc acatagcaga actttaaaag tgctcatcat tggaaaacgt tcttcggggc 7560
gaaaactctc aaggatctta ccgctgttga gatccagttc gatgtaaccc actcgtgcac 7620
ccaactgatc ttcagcatct tttactttca ccagcgtttc tgggtgagca aaaacaggaa 7680
ggcaaaatgc cgcaaaaaag ggaataaggg cgacacggaa atgttgaata ctcatactct 7740
tccttttca atattattga agcatttatc agggttattg tctcatgagc ggatacatat 7800
ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc 7860

cacctgacgt ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca 7920
cgaggccctt tcgtcttcaa gaattgtt 7948

<210> 37
<211> 7963
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 37
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgaccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcaacatc agcaccagca 1800
tccgcggcaa ggtgcagaag gagtacgcct tcttctacaa gctggacatc atccccatcg 1860
acaacgacac caccagctac agcctgacca gctgcaacac cagcgtgatc acccaggcct 1920
gccccaaggt gagcttcgag cccatcccca accactactg cgccccgcc ggcttcgcca 1980
tcctgaagtg caaggacaag aagttcaacg gcaagggccc ctgcaccaac gtgagcaccg 2040
tgcagtgcac ccacggcatc cgccccgtgg tgagcaccca gctgctgctg aacggtagcc 2100
tggccgagga ggaggtggtg atccgcagcg ctaacttcgc cgacaacgcc aaggtgatca 2160
tcgtgcagct gaacgagagc gtggagatca actgcacccg cgctagcgcc cactgcaacc 2220
tgagccgcgc caagtggaac gacaccctga acaagatcgt gatcaagctg cgcgagcagt 2280
tcggcaacaa gaccatcgtg ttcaagcaca gcagcggcgg cgaccccgag atcgtgaccc 2340
acagcttcaa ctgcggcggc gagttcttct actgcaacag cacccagctg ttcaacagca 2400
cctggttcaa cagcacctgg agcaccgagg gcagcaacaa caccgagggc agcgacacca 2460

tcaccctgcc ctgccgcatc aagcagatca tcaacatgtg gcagaaggtg ggcaaggcca 2520
tgtacgcccc ccccatcagc ggccagatcc gctgcagcag caacatcacc ggcctgctgc 2580
tgacccgcga cggcggcaac agcaacaacg agagcgagat cttccgtccg ggcggcggcg 2640
acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtgaag atcgagcccc 2700
tgggcgtggc ccccaccaag gccaagctta ccgtccaggc ccgccagctg ctgagcggca 2760
tcgtgcagca gcagaacaac ctgctgcgcg ccatcgaggc ccagcagcac ctgctgcagc 2820
tgaccgtgtg gggcatcaag cagctgcagg cccgcaccct ggccgtggag cgctacctga 2880
aggaccagca gcagctcgag cagatctgga accacaccac ctggatggag tgggaccgcg 2940
agatcaacaa ctacaccagc ctgatccaca gcctgatcga ggagagccag aaccagcagg 3000
agaagaacga gcaggagctg ctggagctgg acaagtgggc cagcctgtgg aactggttca 3060
acatcaccaa ctggctgtgg tgaggatcca gatctgctgt gccttctagt tgccagccat 3120
ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact cccactgtcc 3180
tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat tctattctgg 3240
ggggtggggt ggggcagcac agcaaggggg aggattggga agacaatagc aggcatgctg 3300
gggatgcggt gggctctatg ggtacccagg gccgcataac ttcgtataat gtatgctata 3360
cgaagttata agatctgtac tgaaatgtgt gggcgtggct taagggtggg aaagaatata 3420
taaggtgggg gtcttatgta gttttgtatc tgttttgcag cagccgccgc cgccatgagc 3480
accaactcgt ttgatggaag cattgtgagc tcatatttga caacgcgcat gcccccatgg 3540
gccggggtgc gtcagaatgt gatgggctcc agcattgatg gtcgccccgt cctgcccgca 3600
aactctacta ccttgaccta cgagaccgtg tctggaacgc cgttggagac tgcagcctcc 3660
gccgccgctt cagccgctgc agccaccgcc cgcgggattg tgactgactt tgctttcctg 3720
agcccgcttg caagcagtgc agcttcccgt tcatccgccc gcgatgacaa gttgacggct 3780
cttttggcac aattggattc tttgacccgg gaacttaatg tcgtttctca gcagctgttg 3840
gatctgcgcc agcaggtttc tgccctgaag gcttcctccc ctcccaatgc ggtttaaaac 3900
ataaataaaa aaccagactc tgtttggatt tggatcaagc aagtgtcttg ctgtctttat 3960
ttaggggttt tgcgcgcgcg gtaggcccgg gaccagcggt ctcggtcgtt gagggtcctg 4020
tgtatttttt ccaggacgtg gtaaaggtga ctctggatgt tcagatacat gggcataagc 4080
ccgtctctgg ggtggaggta gcaccactgc agagcttcat gctgcggggt ggtgttgtag 4140
atgatccagt cgtagcagga gcgctgggcg tggtgcctaa aaatgtcttt cagtagcaag 4200
ctgattgcca ggggcaggcc cttggtgtaa gtgtttacaa agcggttaag ctgggatggg 4260
tgcatacgtg gggatatgag atgcatcttg gactgtattt ttaggttggc tatgttccca 4320
gccatatccc tccggggatt catgttgtgc agaaccacca gcacagtgta tccggtgcac 4380
ttgggaaatt tgtcatgtag cttagaagga aatgcgtgga agaacttgga gacgcccttg 4440
tgacctccaa gattttccat gcattcgtcc ataatgatgg caatgggccc acgggcggcg 4500
gcctgggcga agatatttct gggatcacta acgtcatagt tgtgttccag gatgagatcg 4560
tcataggcca tttttacaaa gcgcgggcgg agggtgccag actgcggtat aatggttcca 4620
tccggcccag gggcgtagtt accctcacag atttgcattt cccacgcttt gagttcagat 4680
ggggggatca tgtctacctg cggggcgatg aagaaaacgg tttccggggt aggggagatc 4740
agctgggaag aaagcaggtt cctgagcagc tgcgacttac cgcagccggt gggcccgtaa 4800
atcacaccta ttaccggctg caactggtag ttaagagagc tgcagctgcc gtcatccctg 4860
agcaggggcg ccacttcgtt aagcatgtcc ctgactcgca tgttttccct gaccaaatcc 4920
gccagaaggc gctcgccgcc cagcgatagc agttcttgca aggaagcaaa gtttttcaac 4980
ggtttgagac cgtccgccgt aggcatgctt ttgagcgttt gaccaagcag ttccaggcgg 5040
tcccacagct cggtcacctg ctctacggca tctcgatcca gcatatctcc tcgtttcgcg 5100
ggttggggcg gctttcgctg tacggcagta gtcggtgctc gtccagacgg gccagggtca 5160
tgtctttcca cgggcgcagg gtcctcgtca gcgtagtctg ggtcacggtg aaggggtgcg 5220
ctccgggctg cgcgctggcc agggtgcgct tgaggctggt cctgctggtg ctgaagcgct 5280
gccggtcttc gccctgcgcg tcggccaggt agcatttgac catggtgtca tagtccagcc 5340
cctccgcggc gtggcccttg gcgcgcagct tgcccttgga ggaggcgccg cacgaggggc 5400
agtgcagact tttgagggcg tagagcttgg gcgcgagaaa taccgattcc ggggagtagg 5460
catccgcgcc gcaggccccg cagacggtct cgcattccac gagccaggtg agctctggcc 5520
gttcggggtc aaaaaccagg tttcccccat gctttttgat gcgtttctta cctctggttt 5580
ccatgagccg gtgtccacgc tcggtgacga aaaggctgtc cgtgtccccg tatacagact 5640
tgagaggcct gtcctcgagc ggtgttccgc ggtcctcctc gtatagaaac tcggaccact 5700
ctgagacaaa ggctcgcgtc caggccagca cgaaggaggc taagtgggag gggtagcggt 5760

cgttgtccac taggggtcc actcgctcca gggtgtgaag acacatgtcg ccctcttcgg 5820
catcaaggaa ggtgattggt ttgtaggtgt aggccacgtg accgggtgtt cctgaagggg 5880
ggctataaaa gggggtgggg gcgcgttcgt cctcactctc ttccgcatcg ctgtctgcga 5940
gggccagctg ttggggtgag tcgacgcgag gctggatggc cttccccatt atgattcttc 6000
tcgcttccgg cggcatcggg atgcccgcgt tgcaggccat gctgtccagg caggtagatg 6060
acgaccatca gggacagctt caaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 6120
tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa 6180
gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct 6240
ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc 6300
cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg 6360
tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt tcagcccgac cgctgcgcct 6420
tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag 6480
cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga 6540
agtggtggcc taactacggc tacactagaa ggacagtatt tggtatctgc gctctgctga 6600
agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg 6660
gtagcggtgg ttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag 6720
aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag 6780
ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat 6840
gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct 6900
taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac 6960
tccccgtcgt gtagataact acgatacggg agggcttacc atctggcccc agtgctgcaa 7020
tgataccgcg agacccacgc tcaccggctc cagatttatc agcaataaac cagccagccg 7080
gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc ctccatccag tctattaatt 7140
gttgccggga agctagagta agtagttcgc cagttaatag tttgcgcaac gttgttgcca 7200
ttgctgcagg catcgtggtg tcacgctcgt cgtttggtat ggcttcattc agctccggtt 7260
cccaacgatc aaggcgagtt acatgatccc ccatgttgtg caaaaaagcg gttagctcct 7320
tcggtcctcc gatcgttgtc agaagtaagt tggccgcagt gttatcactc atggttatgg 7380
cagcactgca taattctctt actgtcatgc catccgtaag atgcttttct gtgactggtg 7440
agtactcaac caagtcattc tgagaatagt gtatgcggcg accgagttgc tcttgcccgg 7500
cgtcaacacg ggataatacc gcgccacata gcagaacttt aaaagtgctc atcattggaa 7560
aacgttcttc ggggcgaaaa ctctcaagga tcttaccgct gttgagatcc agttcgatgt 7620
aacccactcg tgcacccaac tgatcttcag catcttttac tttcaccagc gtttctgggt 7680
gagcaaaaac aggaaggcaa aatgccgcaa aaaagggaat aagggcgaca cggaaatgtt 7740
gaatactcat actcttcctt tttcaatatt attgaagcat ttatcagggt tattgtctca 7800
tgagcggata catatttgaa tgtatttaga aaaataaaca aatagggggtt ccgcgcacat 7860
ttccccgaaa agtgccacct gacgtctaag aaaccattat tatcatgaca ttaacctata 7920
aaaataggcg tatcacgagg ccctttcgtc ttcaagaatt gtt 7963

<210> 38
<211> 7966
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 38
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360

actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcaacatc agcaccagca 1800
tccgcggcaa ggtgcagaag gagtacgcct tcttctacaa gctggacatc atccccatcg 1860
acaacgacac caccagctac agcctgacca gctgcaacac cagcgtgatc acccaggcct 1920
gccccaaggt gagcttcgag cccatcccca accactactg cgcccccgcc ggcttcgcca 1980
tcctgaagtg caaggacaag aagttcaacg gcaagggccc ctgcaccaac gtgagcaccg 2040
tgcagtgcac ccacggcatc cgccccgtgg tgagcaccca gctgctgctg aacggtagcc 2100
tggccgagga ggaggtggtg atccgcagcg ctaacttcgc cgacaacgcc aaggtgatca 2160
tcgtgcagct gaacgagagc gtggagatca actgcacccg ccccaacaac aacacccgca 2220
agagcatcca catcggcccc ggccgcgcct tctacaccac cggcgagatc atcggcgaca 2280
tccgccaggc ccactgcaac ctgagccgcg ccaagtggaa cgacaccctg aacaagatcg 2340
tgatcaagct gcgcgagcag ttcggcaaca agaccatcgt gttcaagcac agcagcggcg 2400
gcgaccccga gatcgtgacc cacagcttca actgcggcgg cgagttcttc tactgcaaca 2460
gcgctagcct gccctgccgc atcaagcaga tcatcaacat gtggcagaag gtgggcaagg 2520
ccatgtacgc ccccccccatc agcggccaga tccgctgcag cagcaacatc accggcctgc 2580
tgctgacccg cgacggcggc aacagcaaca acgagagcga gatcttccgt ccgggcggcg 2640
gcgacatgcg cgacaactgg cgcagcgagc tgtacaagta caaggtggtg aagatcgagc 2700
ccctgggcgt ggcccccacc aaggccaagc ttaccgtcca ggcccgccag ctgctgagcg 2760
gcatcgtgca gcagcagaac aacctgctgc gcgccatcga ggcccagcag cacctgctgc 2820
agctgaccgt gtggggcatc aagcagctgc aggcccgcac cctggccgtg gagcgctacc 2880
tgaaggacca gcagcagctc gagcagatct ggaaccacac cacctggatg gagtgggacc 2940
gcgagatcaa caactacacc agcctgatcc acagcctgat cgaggagagc cagaaccagc 3000
aggagaagaa cgagcaggag ctgctggagc tggacaagtg ggccagcctg tggaactggt 3060
tcaacatcac caactggctg tggtgaggat ccagatctgc tgtgccttct agttgccagc 3120
catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg 3180
tcctttccta ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc 3240
tgggggggtgg ggtggggcag cacagcaagg gggaggattg ggaagacaat agcaggcatg 3300
ctggggatgc ggtgggctct atgggtaccc agggccgcat aacttcgtat aatgtatgct 3360
atacgaagtt ataagatctg tactgaaatg tgtgggcgtg gcttaagggt gggaaagaat 3420
atataaggtg ggggtcttat gtagttttgt atctgttttg cagcagccgc cgccgccatg 3480
agcaccaact cgtttgatgg aagcattgtg agctcatatt tgacaacgcg catgccccca 3540
tgggccgggg tgcgtcagaa tgtgatgggc tccagcattg atggtcgccc cgtcctgccc 3600
gcaaactcta ctaccttgac ctacgagacc gtgtctggaa cgccgttgga gactgcagcc 3660

tccgccgccg cttcagccgc tgcagccacc gcccgcggga ttgtgactga ctttgctttc 3720
ctgagcccgc ttgcaagcag tgcagcttcc cgttcatccg cccgcgatga caagttgacg 3780
gctcttttgg cacaattgga ttctttgacc cgggaactta atgtcgtttc tcagcagctg 3840
ttggatctgc gccagcaggt ttctgccctg aaggcttcct cccctcccaa tgcggtttaa 3900
aacataaata aaaaaccaga ctctgtttgg atttggatca agcaagtgtc ttgctgtctt 3960
tatttagggg ttttgcgcgc gcggtaggcc cgggaccagc ggtctcggtc gttgagggtc 4020
ctgtgtattt tttccaggac gtggtaaagg tgactctgga tgttcagata catgggcata 4080
agcccgtctc tggggtggag gtagcaccac tgcagagctt catgctgcgg ggtggtgttg 4140
tagatgatcc agtcgtagca ggagcgctgg gcgtggtgcc taaaaatgtc tttcagtagc 4200
aagctgattg ccaggggcag gcccttggtg taagtgttta caaagcggtt aagctgggat 4260
gggtgcatac gtggggatat gagatgcatc ttggactgta tttttaggtt ggctatgttc 4320
ccagccatat ccctccgggg attcatgttg tgcagaacca ccagcacagt gtatccggtg 4380
cacttgggaa atttgtcatg tagcttagaa ggaaatgcgt ggaagaactt ggagacgccc 4440
ttgtgacctc caagattttc catgcattcg tccataatga tggcaatggg cccacgggcg 4500
gcggcctggg cgaagatatt tctgggatca ctaacgtcat agttgtgttc caggatgaga 4560
tcgtcatagg ccatttttac aaagcgcggg cggagggtgc cagactgcgg tataatggtt 4620
ccatccggcc caggggcgta gttaccctca cagatttgca tttcccacgc tttgagttca 4680
gatgggggga tcatgtctac ctgcggggcg atgaagaaaa cggtttccgg ggtaggggag 4740
atcagctggg aagaaagcag gttcctgagc agctgcgact taccgcagcc ggtgggcccg 4800
taaatcacac ctattaccgg ctgcaactgg tagttaagag agctgcagct gccgtcatcc 4860
ctgagcaggg gggccacttc gttaagcatg tccctgactc gcatgttttc cctgaccaaa 4920
tccgccagaa ggcgctcgcc gcccagcgat agcagttctt gcaaggaagc aaagttttc 4980
aacggtttga gaccgtccgc cgtaggcatg cttttgagcg tttgaccaag cagttccagg 5040
cggtcccaca gctcggtcac ctgctctacg gcatctcgat ccagcatatc tcctcgtttc 5100
gcgggttggg gcggctttcg ctgtacggca gtagtcggtg ctcgtccaga cgggccaggg 5160
tcatgtcttt ccacgggcgc agggtcctcg tcagcgtagt ctgggtcacg gtgaaggggt 5220
gcgctccggg ctgcgcgctg gccagggtgc gcttgaggct ggtcctgctg gtgctgaagc 5280
gctgccggtc ttcgccctgc gcgtcggcca ggtagcattt gaccatggtg tcatagtcca 5340
gcccctccgc ggcgtggccc ttggcgcgca gcttgccctt ggaggaggcg ccgcacgagg 5400
ggcagtgcag acttttgagg gcgtagagct tgggcgcgag aaataccgat tccggggagt 5460
aggcatccgc gccgcaggcc ccgcagacgg tctcgcattc cacgagccag gtgagctctg 5520
gccgttcggg gtcaaaaacc aggtttcccc catgcttttt gatgcgtttc ttacctctgg 5580
tttccatgag ccggtgtcca cgctcggtga cgaaaaggct gtccgtgtcc ccgtatacag 5640
acttgagagg cctgtcctcg agcggtgttc cgcggtcctc ctcgtataga aactcggacc 5700
actctgagac aaaggctcgc gtccaggcca gcacgaagga ggctaagtgg gaggggtagc 5760
ggtcgttgtc cactaggggg tccactcgct ccagggtgtg aagacacatg tcgccctctt 5820
cggcatcaag gaaggtgatt ggtttgtagg tgtaggccac gtgaccgggt gttcctgaag 5880
gggggctata aaagggggtg ggggcgcgtt cgtcctcact ctcttccgca tcgctgtctg 5940
cgagggccag ctgttggggt gagtcgacgc gaggctggat ggccttcccc attatgattc 6000
ttctcgcttc cggcggcatc gggatgcccg cgttgcaggc catgctgtcc aggcaggtag 6060
atgacgacca tcagggacag cttcaaggcc agcaaaaggc caggaaccgt aaaaaggccg 6120
cgttgctggc gtttttccat aggctccgcc cccctgacga gcatcacaaa aatcgacgct 6180
caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt cccccctggaa 6240
gctcccctcgt gcgctctcct gttccgaccc tgccgcttac cggatacctg tccgcctttc 6300
tcccttcggg aagcgtggcg ctttctcata gctcacgctg taggtatctc agttcggtgt 6360
aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc gaccgctgcg 6420
ccttatccgg taactatcgt cttgagtcca acccggtaag acacgactta tcgccactgg 6480
cagcagccac tggtaacagg attagcagag cgaggtatgt aggcggtgct acagagttct 6540
tgaagtggtg gcctaactac ggctacacta gaaggacagt atttggtatc tgcgctctgc 6600
tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg 6660
ctggtagcgg tggttttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc 6720
aagaagatcc tttgatcttt tctacggggt ctgacgctca gtggaacgaa aactcacgtt 6780
aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac ctagatcctt ttaaattaaa 6840
aatgaagttt taaatcaatc taaagtatat atgagtaaac ttggtctgac agttaccaat 6900
gcttaatcag tgaggcacct atctcagcga tctgtctatt tcgttcatcc atagttgcct 6960

gactccccgt cgtgtagata actacgatac gggagggctt accatctggc cccagtgctg 7020
caatgatacc gcgagaccca cgctcaccgg ctccagattt atcagcaata aaccagccag 7080
ccggaagggc cgagcgcaga agtggtcctg caactttatc cgcctccatc cagtctatta 7140
attgttgccg ggaagctaga gtaagtagtt cgccagttaa tagtttgcgc aacgttgttg 7200
ccattgctgc aggcatcgtg gtgtcacgct cgtcgtttgg tatggcttca ttcagctccg 7260
gttcccaacg atcaaggcga gttacatgat cccccatgtt gtgcaaaaaa gcggttagct 7320
ccttcggtcc tccgatcgtt gtcagaagta agttggccgc agtgttatca ctcatggtta 7380
tggcagcact gcataattct cttactgtca tgccatccgt aagatgcttt tctgtgactg 7440
gtgagtactc aaccaagtca ttctgagaat agtgtatgcg gcgaccgagt tgctcttgcc 7500
cggcgtcaac acgggataat accgcgccac atagcagaac tttaaaagtg ctcatcattg 7560
gaaaacgttc ttcggggcga aaactctcaa ggatcttacc gctgttgaga tccagttcga 7620
tgtaacccac tcgtgcaccc aactgatctt cagcatcttt tactttcacc agcgtttctg 7680
ggtgagcaaa aacaggaagg caaaatgccg caaaaaaggg aataagggcg acacggaaat 7740
gttgaatact catactcttc ctttttcaat attattgaag catttatcag ggttattgtc 7800
tcatgagcgg atacatattt gaatgtattt agaaaaataa acaaataggg gttccgcgca 7860
catttccccg aaaagtgcca cctgacgtct aagaaaccat tattatcatg acattaacct 7920
ataaaaatag gcgtatcacg aggccctttc gtcttcaaga attgtt 7966

<210> 39
<211> 7870
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 39
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560

tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaccagctg caacaccagc gtgatcaccc 1740
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 1800
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 1860
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 1920
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 1980
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 2040
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 2100
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2160
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2220
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 2280
gcaacagcac ccagctgttc aacagcacct ggttcaacag cacctggagc accgagggca 2340
gcaacaacac cgagggcagc gacaccatca ccctgccctg ccgcatcaag cagatcatca 2400
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 2460
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 2520
gcgagatctt ccgtccgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 2580
agtacaaggt ggtgaagatc gagcccctgg gcgtggcccc caccaaggcc aagcttaccg 2640
tccaggcccg ccagctgctg agcggcatcg tgcagcagca gaacaacctg ctgcgcgcca 2700
tcgaggccca gcagcacctg ctgcagctga ccgtgtgggg catcaagcag ctgcaggccc 2760
gcaccctggc cgtggagcgc tacctgaagg accagcagca gctcgagcag atctggaacc 2820
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 2880
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 2940
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtga ggatccagat 3000
ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctcccccgtg ccttccttga 3060
ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 3120
gtctgagtag gtgtcattct attctggggg gtggggtggg gcagcacagc aagggggagg 3180
attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt acccagggcc 3240
gcataacttc gtataatgta tgctatacga agttataaga tctgtactga aatgtgtggg 3300
cgtggcttaa gggtgggaaa gaatatataa ggtgggggtc ttatgtagtt ttgtatctgt 3360
tttgcagcag ccgccgccgc catgagcacc aactcgtttg atggaagcat tgtgagctca 3420
tatttgacaa cgcgcatgcc cccatgggcc ggggtgcgtc agaatgtgat gggctccagc 3480
attgatggtc gccccgtcct gcccgcaaac tctactacct tgacctacga gaccgtgtct 3540
ggaacgccgt tggagactgc agcctccgcc gccgcttcag ccgctgcagc caccgcccgc 3600
gggattgtga ctgactttgc tttcctgagc ccgcttgcaa gcagtgcagc ttcccgttca 3660
tccgcccgcg atgacaagtt gacggctctt ttggcacaat tggattcttt gacccgggaa 3720
cttaatgtcg tttctcagca gctgttggat ctgcgccagc aggtttctgc cctgaaggct 3780
tcctcccctc ccaatgcggt ttaaaacata aataaaaaac cagactctgt ttggatttgg 3840
atcaagcaag tgtcttgctg tctttattta ggggttttgc gcgcgcggta ggcccgggac 3900
cagcggtctc ggtcgttgag ggtcctgtgt attttttcca ggacgtggta aaggtgactc 3960
tggatgttca gatacatggg cataagcccg tctctggggt ggaggtagca ccactgcaga 4020
gcttcatgct gcggggtggt gttgtagatg atccagtcgt agcaggagcg ctgggcgtgg 4080
tgcctaaaaa tgtctttcag tagcaagctg attgccaggg gcaggccctt ggtgtaagtg 4140
tttacaaagc ggttaagctg ggatgggtgc atacgtgggg atatgagatg catcttggac 4200
tgtattttta ggttggctat gttcccagcc atatccctcc ggggattcat gttgtgcaga 4260
accaccagca cagtgtatcc ggtgcacttg ggaaatttgt catgtagctt agaaggaaat 4320
gcgtggaaga acttggagac gcccttgtga cctccaagat tttccatgca ttcgtccata 4380
atgatggcaa tgggcccacg ggcggcggcc tgggcgaaga tatttctggg atcactaacg 4440
tcatagttgt gttccaggat gagatcgtca taggccattt ttacaaagcg cgggcggagg 4500
gtgccagact gcggtataat ggttccatcc ggcccagggg cgtagttacc ctcacagatt 4560
tgcatttccc acgctttgag ttcagatggg gggatcatgt ctacctgcgg ggcgatgaag 4620
aaaacggttt ccggggtagg ggagatcagc tgggaagaaa gcaggttcct gagcagctgc 4680
gacttaccgc agccggtggg cccgtaaatc acacctatta ccggctgcaa ctggtagtta 4740
agagagctgc agctgccgtc atccctgagc agggggggca cttcgttaag catgtccctg 4800
actcgcatgt tttccctgac caaatccgcc agaaggcgct cgccgcccag cgatagcagt 4860

tcttgcaagg aagcaaagtt tttcaacggt ttgagaccgt ccgccgtagg catgcttttg 4920
agcgtttgac caagcagttc caggcggtcc cacagctcgg tcacctgctc tacggcatct 4980
cgatccagca tatctcctcg tttcgcgggt tggggcggct ttcgctgtac ggcagtagtc 5040
ggtgctcgtc cagacgggcc agggtcatgt ctttccacgg gcgcagggtc ctcgtcagcg 5100
tagtctgggt cacggtgaag gggtgcgctc cgggctgcgc gctggccagg gtgcgcttga 5160
ggctggtcct gctggtgctg aagcgctgcc ggtcttcgcc ctgcgcgtcg gccaggtagc 5220
atttgaccat ggtgtcatag tccagcccct ccgcggcgtg gcccttggcg cgcagcttgc 5280
ccttggagga ggcgccgcac gaggggcagt gcagactttt gagggcgtag agcttgggcg 5340
cgagaaatac cgattccggg gagtaggcat ccgcgccgca ggccccgcag acggtctcgc 5400
attccacgag ccaggtgagc tctggccgtt cggggtcaaa aaccaggttt cccccatgct 5460
ttttgatgcg tttcttacct ctggtttcca tgagccggtg tccacgctcg gtgacgaaaa 5520
ggctgtccgt gtccccgtat acagacttga gaggcctgtc ctcgagcggt gttccgcggt 5580
cctcctcgta tagaaactcg gaccactctg agacaaaggc tcgcgtccag gccagcacga 5640
aggaggctaa gtgggagggg tagcggtcgt tgtccactag ggggtccact cgctccaggg 5700
tgtgaagaca catgtcgccc tcttcggcat caaggaaggt gattggtttg taggtgtagg 5760
ccacgtgacc gggtgttcct gaaggggggc tataaaaggg ggtgggggcg cgttcgtcct 5820
cactctcttc cgcatcgctg tctgcgaggg ccagctgttg gggtgagtcg acgcgaggct 5880
ggatggcctt ccccattatg attcttctcg cttccggcgg catcgggatg cccgcgttgc 5940
aggccatgct gtccaggcag gtagatgacg accatcaggg acagcttcaa ggccagcaaa 6000
aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccccctg 6060
acgagcatca caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa 6120
gataccaggc gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc 6180
ttaccggata cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac 6240
gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac 6300
ccccgttca gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg 6360
taagacacga cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt 6420
atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagga 6480
cagtatttgg tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct 6540
cttgatccgg caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga 6600
ttacgcgcag aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg 6660
ctcagtggaa cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct 6720
tcacctagat ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt 6780
aaacttggtc tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc 6840
tatttcgttc atccatagtt gcctgactcc ccgtcgtgta gataactacg atacgggagg 6900
gcttaccatc tggccccagt gctgcaatga taccgcgaga cccacgctca ccggctccag 6960
atttatcagc aataaaccag ccagccggaa gggccgagcg cagaagtggt cctgcaactt 7020
tatccgcctc catccagtct attaattgtt gccgggaagc tagagtaagt agttcgccag 7080
ttaatagttt gcgcaacgtt gttgccattg ctgcaggcat cgtggtgtca cgctcgtcgt 7140
ttggtatggc ttcattcagc tccggttccc aacgatcaag gcgagttaca tgatccccca 7200
tgttgtgcaa aaaagcggtt agctccttcg gtcctccgat cgttgtcaga agtaagttgg 7260
ccgcagtgtt atcactcatg gttatggcag cactgcataa ttctcttact gtcatgccat 7320
ccgtaagatg cttttctgtg actggtgagt actcaaccaa gtcattctga gaatagtgta 7380
tgcggcgacc gagttgctct tgcccggcgt caacacggga taataccgcg ccacatagca 7440
gaactttaaa agtgctcatc attggaaaac gttcttcggg gcgaaaactc tcaaggatct 7500
taccgctgtt gagatccagt tcgatgtaac ccactcgtgc acccaactga tcttcagcat 7560
cttttacttt caccagcgtt tctgggtgag caaaaacagg aaggcaaaat gccgcaaaaa 7620
agggaataag ggcgacacgg aaatgttgaa tactcatact cttccttttt caatattatt 7680
gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt atttagaaaa 7740
ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac gtctaagaaa 7800
ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc tttcgtcttc 7860
aagaattgtt 7870

<210> 40

<211> 7906
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 40
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgaccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaagaactg cagcttcaac atcagcacca 1740
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 1800
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 1860
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 1920
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 1980
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2040
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2100
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgcgctagc gcccactgca 2160
acctgagccg cgccaagtgg aacgacaccc tgaacaagat cgtgatcaag ctgcgcgagc 2220
agttcggcaa caagaccatc gtgttcaagc acagcagcgg cggcgacccc gagatcgtga 2280
cccacagctt caactgcggc ggcgagttct tctactgcaa cagcacccag ctgttcaaca 2340
gcacctggtt caacagcacc tggagcaccg agggcagcaa caacaccgag ggcagcgaca 2400
ccatcaccct gccctgccgc atcaagcaga tcatcaacat gtggcagaag gtgggcaagg 2460
ccatgtacgc ccccccccatc agcggccaga tccgctgcag cagcaacatc accggcctgc 2520
tgctgacccg cgacggcggc aacagcaaca acgagagcga gatcttccgt ccgggcggcg 2580
gcgacatgcg cgacaactgg cgcagcgagc tgtacaagta caaggtggtg aagatcgagc 2640
ccctgggcgt ggccccacc aaggccaagc ttaccgtcca ggcccgccag ctgctgagcg 2700
gcatcgtgca gcagcagaac aacctgctgc gcgccatcga ggcccagcag cacctgctgc 2760
agctgaccgt gtggggcatc aagcagctgc aggcccgcac cctggccgtg gagcgctacc 2820

tgaaggacca gcagcagctc gagcagatct ggaaccacac cacctggatg gagtgggacc 2880
gcgagatcaa caactacacc agcctgatcc acagcctgat cgaggagagc cagaaccagc 2940
aggagaagaa cgagcaggag ctgctggagc tggacaagtg ggccagcctg tggaactggt 3000
tcaacatcac caactggctg tggtgaggat ccagatctgc tgtgccttct agttgccagc 3060
catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg 3120
tcctttccta ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc 3180
tgggggggtgg ggtggggcag cacagcaagg gggaggattg ggaagacaat agcaggcatg 3240
ctggggatgc ggtgggctct atgggtaccc agggccgcat aacttcgtat aatgtatgct 3300
atacgaagtt ataagatctg tactgaaatg tgtgggcgtg gcttaagggt gggaaagaat 3360
atataaggtg ggggtcttat gtagttttgt atctgttttg cagcagccgc cgccgccatg 3420
agcaccaact cgtttgatgg aagcattgtg agctcatatt tgacaacgcg catgccccca 3480
tgggccgggg tgcgtcagaa tgtgatgggc tccagcattg atggtcgccc cgtcctgccc 3540
gcaaactcta ctaccttgac ctacgagacc gtgtctggaa cgccgttgga gactgcagcc 3600
tccgccgccg cttcagccgc tgcagccacc gcccgcggga ttgtgactga ctttgctttc 3660
ctgagcccgc ttgcaagcag tgcagcttcc cgttcatccg cccgcgatga caagttgacg 3720
gctcttttgg cacaattgga ttctttgacc cgggaactta atgtcgtttc tcagcagctg 3780
ttggatctgc gccagcaggt ttctgccctg aaggcttcct cccctcccaa tgcggtttaa 3840
aacataaata aaaaaccaga ctctgtttgg atttggatca agcaagtgtc ttgctgtctt 3900
tatttagggg ttttgcgcgc gcggtaggcc cgggaccagc ggtctcggtc gttgagggtc 3960
ctgtgtattt tttccaggac gtggtaaagg tgactctgga tgttcagata catgggcata 4020
agcccgtctc tggggtggag gtagcaccac tgcagagctt catgctgcgg ggtggtgttg 4080
tagatgatcc agtcgtagca ggagcgctgg gcgtggtgcc taaaaatgtc tttcagtagc 4140
aagctgattg ccaggggcag gcccttggtg taagtgttta caaagcggtt aagctgggat 4200
gggtgcatac gtggggatat gagatgcatc ttggactgta tttttaggtt ggctatgttc 4260
ccagccatat ccctccgggg attcatgttg tgcagaacca ccagcacagt gtatccggtg 4320
cacttgggaa atttgtcatg tagcttagaa ggaaatgcgt ggaagaactt ggagacgccc 4380
ttgtgacctc caagattttc catgcattcg tccataatga tggcaatggg cccacgggcg 4440
gcggcctggg cgaagatatt tctgggatca ctaacgtcat agttgtgttc caggatgaga 4500
tcgtcatagg ccatttttac aaagcgcggg cggagggtgc cagactgcgg tataatggtt 4560
ccatccggcc caggggcgta gttaccctca cagatttgca tttcccacgc tttgagttca 4620
gatgggggga tcatgtctac ctgcggggcg atgaagaaaa cggtttccgg ggtaggggag 4680
atcagctggg aagaaagcag gttcctgagc agctgcgact taccgcagcc ggtgggcccg 4740
taaatcacac ctattaccgg ctgcaactgg tagttaagag agctgcagct gccgtcatcc 4800
ctgagcaggg gggccacttc gttaagcatg tccctgactc gcatgttttc cctgaccaaa 4860
tccgccagaa ggcgctcgcc gcccagcgat agcagttctt gcaaggaagc aaagtttttc 4920
aacggtttga gaccgtccgc cgtaggcatg cttttgagcg tttgaccaag cagttccagg 4980
cggtcccaca gctcggtcac ctgctctacg gcatctcgat ccagcatatc tcctcgtttc 5040
gcgggttggg gcggctttcg ctgtacggca gtagtcggtg ctcgtccaga cgggccaggg 5100
tcatgtcttt ccacgggcgc agggtcctcg tcagcgtagt ctgggtcacg gtgaaggggt 5160
gcgctccggg ctgcgcgctg gccagggtgc gcttgaggct ggtcctgctg gtgctgaagc 5220
gctgccggtc ttcgccctgc gcgtcggcca ggtagcattt gaccatggtg tcatagtcca 5280
gcccctccgc ggcgtggccc ttggcgcgca gcttgccctt ggaggaggcg ccgcacgagg 5340
ggcagtgcag acttttgagg gcgtagagct tgggcgcgag aaataccgat tccggggagt 5400
aggcatccgc gccgcaggcc ccgcagacgg tctcgcattc cacgagccag gtgagctctg 5460
gccgttcggg gtcaaaaacc aggtttcccc catgcttttt gatgcgtttc ttacctctgg 5520
tttccatgag ccggtgtcca cgctcggtga cgaaaaggct gtccgtgtcc ccgtatacag 5580
acttgagagg cctgtcctcg agcggtgttc cgcggtcctc ctcgtataga aactcggacc 5640
actctgagac aaaggctcgc gtccaggcca gcacgaagga ggctaagtgg gaggggtagc 5700
ggtcgttgtc cactaggggg tccactcgct ccagggtgtg aagacacatg tcgccctctt 5760
cggcatcaag gaaggtgatt ggtttgtagg tgtaggccac gtgaccgggt gttcctgaag 5820
gggggctata aaagggggtg ggggcgcgtt cgtcctcact ctcttccgca tcgctgtctg 5880
cgagggccag ctgttggggt gagtcgacgc gaggctggat ggccttcccc attatgattc 5940
ttctcgcttc cggcggcatc gggatgcccg cgttgcaggc catgctgtcc aggcaggtag 6000
atgacgacca tcagggacag cttcaaggcc agcaaaaggc caggaaccgt aaaaaggccg 6060
cgttgctggc gtttttccat aggctccgcc cccctgacga gcatcacaaa aatcgacgct 6120

caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt ccccctggaa 6180
gctccctcgt gcgctctcct gttccgaccc tgccgcttac cggatacctg tccgcctttc 6240
tcccttcggg aagcgtggcg ctttctcata gctcacgctg taggtatctc agttcggtgt 6300
aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc gaccgctgcg 6360
ccttatccgg taactatcgt cttgagtcca acccggtaag acacgactta tcgccactgg 6420
cagcagccac tggtaacagg attagcagag cgaggtatgt aggcggtgct acagagttct 6480
tgaagtggtg gcctaactac ggctacacta gaaggacagt atttggtatc tgcgctctgc 6540
tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg 6600
ctggtagcgg tggtttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc 6660
aagaagatcc tttgatcttt tctacggggt ctgacgctca gtggaacgaa aactcacgtt 6720
aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac ctagatcctt ttaaattaaa 6780
aatgaagttt taaatcaatc taaagtatat atgagtaaac ttggtctgac agttaccaat 6840
gcttaatcag tgaggcacct atctcagcga tctgtctatt tcgttcatcc atagttgcct 6900
gactccccgt cgtgtagata actacgatac gggagggctt accatctggc cccagtgctg 6960
caatgatacc gcgagaccca cgctcaccgg ctccagattt atcagcaata aaccagccag 7020
ccggaagggc cgagcgcaga agtggtcctg caactttatc cgcctccatc cagtctatta 7080
attgttgccg ggaagctaga gtaagtagtt cgccagttaa tagtttgcgc aacgttgttg 7140
ccattgctgc aggcatcgtg gtgtcacgct cgtcgtttgg tatggcttca ttcagctccg 7200
gttcccaacg atcaaggcga gttacatgat cccccatgtt gtgcaaaaaa gcggttagct 7260
ccttcggtcc tccgatcgtt gtcagaagta agttggccgc agtgttatca ctcatggtta 7320
tggcagcact gcataattct cttactgtca tgccatccgt aagatgcttt tctgtgactg 7380
gtgagtactc aaccaagtca ttctgagaat agtgtatgcg gcgaccgagt tgctcttgcc 7440
cggcgtcaac acgggataat accgcgccac atagcagaac tttaaaagtg ctcatcattg 7500
gaaaacgttc ttcggggcga aaactctcaa ggatcttacc gctgttgaga tccagttcga 7560
tgtaacccac tcgtgcaccc aactgatctt cagcatcttt tactttcacc agcgtttctg 7620
ggtgagcaaa aacaggaagg caaaatgccg caaaaaaggg aataagggcg acacggaaat 7680
gttgaatact catactcttc ctttttcaat attattgaag catttatcag ggttattgtc 7740
tcatgagcgg atacatattt gaatgtattt agaaaaataa acaaataggg gttccgcgca 7800
catttccccg aaaagtgcca cctgacgtct aagaaaccat tattatcatg acattaacct 7860
ataaaaatag gcgtatcacg aggccctttc gtcttcaaga attgtt 7906

<210> 41
<211> 7909
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 41
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780

tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaagaactg cagcttcaac atcagcacca 1740
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 1800
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 1860
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 1920
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 1980
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2040
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2100
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgccccaac aacaacaccc 2160
gcaagagcat ccacatcggc cccggccgcg ccttctacac caccggcgag atcatcggcg 2220
acatccgcca ggcccactgc aacctgagcc gcgccaagtg gaacgacacc ctgaacaaga 2280
tcgtgatcaa gctgcgcgag cagttcggca acaagaccat cgtgttcaag cacagcagcg 2340
gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc ttctactgca 2400
acagcgctag cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 2460
aggccatgta cgcccccccc atcagcggcc agatccgctg cagcagcaac atcaccggcc 2520
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 2580
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 2640
agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 2700
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 2760
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 2820
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 2880
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 2940
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 3000
ggttcaacat caccaactgg ctgtggtgag gatccagatc tgctgtgcct tctagttgcc 3060
agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt gccactccca 3120
ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg tgtcattcta 3180
ttctgggggg tggggtgggg cagcacagca aggggagga ttgggaagac aatagcaggc 3240
atgctgggga tgcggtgggc tctatgggta cccagggccg cataacttcg tataatgtat 3300
gctatacgaa gttataagat ctgtactgaa atgtgtgggc gtggcttaag ggtgggaaag 3360
aatatataag gtgggggtct tatgtagttt tgtatctgtt ttgcagcagc cgccgccgcc 3420
atgagcacca actcgtttga tggaagcatt gtgagctcat atttgacaac gcgcatgccc 3480
ccatgggccg gggtgcgtca gaatgtgatg ggctccagca ttgatggtcg ccccgtcctg 3540
cccgcaaact ctactacctt gacctacgag accgtgtctg gaacgccgtt ggagactgca 3600
gcctccgccg ccgcttcagc cgctgcagcc accgcccgcg ggattgtgac tgactttgct 3660
ttcctgagcc cgcttgcaag cagtgcagct tcccgttcat ccgcccgcga tgacaagttg 3720
acggctcttt tggcacaatt ggattctttg acccgggaac ttaatgtcgt ttctcagcag 3780
ctgttggatc tgcgccagca ggtttctgcc ctgaaggctt cctcccctcc caatgcggtt 3840
taaaacataa ataaaaaacc agactctgtt tggatttgga tcaagcaagt gtcttgctgt 3900
ctttatttag gggttttgcg cgcgcggtag gcccgggacc agcggtctcg gtcgttgagg 3960
gtcctgtgta ttttttccag gacgtggtaa aggtgactct ggatgttcag atacatgggc 4020
ataagcccgt ctctggggtg gaggtagcac cactgcagag cttcatgctg cggggtggtg 4080

ttgtagatga tccagtcgta gcaggagcgc tgggcgtggt gcctaaaaat gtctttcagt 4140
agcaagctga ttgccagggg caggcccttg gtgtaagtgt ttacaaagcg gttaagctgg 4200
gatgggtgca tacgtgggga tatgagatgc atcttggact gtatttttag gttggctatg 4260
ttcccagcca tatccctccg gggattcatg ttgtgcagaa ccaccagcac agtgtatccg 4320
gtgcacttgg gaaatttgtc atgtagctta gaaggaaatg cgtggaagaa cttggagacg 4380
cccttgtgac ctccaagatt ttccatgcat tcgtccataa tgatggcaat gggcccacgg 4440
gcggcggcct gggcgaagat atttctggga tcactaacgt catagttgtg ttccaggatg 4500
agatcgtcat aggccatttt tacaaagcgc gggcggaggg tgccagactg cggtataatg 4560
gttccatccg gcccaggggc gtagttaccc tcacagattt gcatttccca cgctttgagt 4620
tcagatgggg ggatcatgtc tacctgcggg gcgatgaaga aaacggtttc cggggtaggg 4680
gagatcagct gggaagaaag caggttcctg agcagctgcg acttaccgca gccggtgggc 4740
ccgtaaatca cacctattac cggctgcaac tggtagttaa gagagctgca gctgccgtca 4800
tccctgagca ggggggccac ttcgttaagc atgtccctga ctcgcatgtt ttccctgacc 4860
aaatccgcca gaaggcgctc gccgcccagc gatagcagtt cttgcaagga agcaaagttt 4920
ttcaacggtt tgagaccgtc cgccgtaggc atgcttttga gcgtttgacc aagcagttcc 4980
aggcggtccc acagctcggt cacctgctct acggcatctc gatccagcat atctcctcgt 5040
ttcgcgggtt ggggcggctt tcgctgtacg gcagtagtcg gtgctcgtcc agacgggcca 5100
gggtcatgtc tttccacggg cgcagggtcc tcgtcagcgt agtctgggtc acggtgaagg 5160
ggtgcgctcc gggctgcgcg ctggccaggg tgcgcttgag gctggtcctg ctggtgctga 5220
agcgctgccg gtcttcgccc tgcgcgtcgg ccaggtagca tttgaccatg gtgtcatagt 5280
ccagcccctc cgcggcgtgg cccttggcgc gcagcttgcc cttggaggag gcgccgcacg 5340
aggggcagtg cagacttttg agggcgtaga gcttgggcgc gagaaatacc gattccgggg 5400
agtaggcatc cgcgccgcag gccccgcaga cggtctcgca ttccacgagc caggtgagct 5460
ctggccgttc ggggtcaaaa accaggtttc ccccatgctt tttgatgcgt ttcttacctc 5520
tggtttccat gagccggtgt ccacgctcgg tgacgaaaag gctgtccgtg tccccgtata 5580
cagacttgag aggcctgtcc tcgagcggtg ttccgcggtc ctcctcgtat agaaactcgg 5640
accactctga gacaaaggct cgcgtccagg ccagcacgaa ggaggctaag tgggaggggt 5700
agcggtcgtt gtccactagg gggtccactc gctccagggt gtgaagacac atgtcgccct 5760
cttcggcatc aaggaaggtg attggtttgt aggtgtaggc cacgtgaccg ggtgttcctg 5820
aaggggggct ataaaagggg gtgggggcgc gttcgtcctc actctcttcc gcatcgctgt 5880
ctgcgagggc cagctgttgg ggtgagtcga cgcgaggctg gatggccttc cccattatga 5940
ttcttctcgc ttccggcggc atcgggatgc ccgcgttgca ggccatgctg tccaggcagg 6000
tagatgacga ccatcaggga cagcttcaag gccagcaaaa ggccaggaac cgtaaaaagg 6060
ccgcgttgct ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac 6120
gctcaagtca gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg 6180
gaagctccct cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct 6240
ttctcccttc gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg 6300
tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct 6360
gcgccttatc cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac 6420
tggcagcagc cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt 6480
tcttgaagtg gtggcctaac tacggctaca ctagaaggac agtatttggt atctgcgctc 6540
tgctgaagcc agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca 6600
ccgctggtag cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat 6660
ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac 6720
gttaagggat tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt 6780
aaaaatgaag ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc 6840
aatgcttaat cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg 6900
cctgactccc cgtcgtgtag ataactacga tacgggaggg cttaccatct ggccccagtg 6960
ctgcaatgat accgcgagac ccacgctcac cggctccaga tttatcagca ataaaccagc 7020
cagccggaag ggccgagcgc agaagtggtc ctgcaacttt atccgcctcc atccagtcta 7080
ttaattgttg ccgggaagct agagtaagta gttcgccagt taatagtttg cgcaacgttg 7140
ttgccattgc tgcaggcatc gtggtgtcac gctcgtcgtt tggtatggct tcattcagct 7200
ccggttccca acgatcaagg cgagttacat gatcccccat gttgtgcaaa aaagcggtta 7260
gctccttcgg tcctccgatc gttgtcagaa gtaagttggc cgcagtgtta tcactcatgg 7320
ttatggcagc actgcataat tctcttactg tcatgccatc cgtaagatgc ttttctgtga 7380

ctggtgagta ctcaaccaag tcattctgag aatagtgtat gcggcgaccg agttgctctt 7440
gcccggcgtc aacacgggat aataccgcgc cacatagcag aactttaaaa gtgctcatca 7500
ttggaaaacg ttcttcgggg cgaaaactct caaggatctt accgctgttg agatccagtt 7560
cgatgtaacc cactcgtgca cccaactgat cttcagcatc ttttactttc accagcgttt 7620
ctgggtgagc aaaaacagga aggcaaaatg ccgcaaaaaa gggaataagg gcgacacgga 7680
aatgttgaat actcatactc ttccttttc aatattattg aagcatttat cagggttatt 7740
gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata ggggttccgc 7800
gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc atgacattaa 7860
cctataaaaa taggcgtatc acgaggccct ttcgtcttca agaattgtt 7909

<210> 42
<211> 7867
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 42
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggtt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgaccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcgctagc accagctgca 1800
acaccagcgt gatcacccag gcctgccca aggtgagctt cgagcccatc cccaaccact 1860
actgcgcccc cgccggcttc gccatcctga agtgcaagga caagaagttc aacggcaagg 1920
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 1980
cccagctgct gctgaacggt agcctggccg aggaggaggt ggtgatccgc agcgctaact 2040

tcgccgacaa cgccaaggtg atcatcgtgc agctgaacga gagcgtggag atcaactgca 2100
cccgcgctag cgcccactgc aacctgagcc gcgccaagtg gaacgacacc ctgaacaaga 2160
tcgtgatcaa gctgcgcgag cagttcggca acaagaccat cgtgttcaag cacagcagcg 2220
gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc ttctactgca 2280
acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc gagggcagca 2340
acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag atcatcaaca 2400
tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag atccgctgca 2460
gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac aacgagagcg 2520
agatcttccg tccgggcggc ggcgacatgc gcgacaactg gcgcagcgag ctgtacaagt 2580
acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag cttaccgtcc 2640
aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg cgcgccatcg 2700
aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg caggcccgca 2760
ccctggccgt ggagcgctac ctgaaggacc agcagcagct cgagcagatc tggaaccaca 2820
ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc cacagcctga 2880
tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag ctggacaagt 2940
gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtgagga tccagatctg 3000
ctgtgccttc tagttgccag ccatctgttg tttgcccctc ccccgtgcct tccttgaccc 3060
tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca tcgcattgtc 3120
tgagtaggtg tcattctatt ctgggggggtg gggtggggca gcacagcaag ggggaggatt 3180
gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc cagggccgca 3240
taacttcgta taatgtatgc tatacgaagt tataagatct gtactgaaat gtgtgggcgt 3300
ggcttaaggg tgggaaagaa tatataaggt gggggtctta tgtagttttg tatctgtttt 3360
gcagcagccg ccgccgccat gagcaccaac tcgtttgatg gaagcattgt gagctcatat 3420
ttgacaacgc gcatgccccc atgggccggg gtgcgtcaga atgtgatggg ctccagcatt 3480
gatggtcgcc ccgtcctgcc cgcaaactct actaccttga cctacgagac cgtgtctgga 3540
acgccgttgg agactgcagc ctccgccgcc gcttcagccg ctgcagccac cgcccgcggg 3600
attgtgactg actttgcttt cctgagcccg cttgcaagca gtgcagcttc ccgttcatcc 3660
gcccgcgatg acaagttgac ggctcttttg gcacaattgg attctttgac ccgggaactt 3720
aatgtcgttt ctcagcagct gttggatctg cgccagcagg tttctgccct gaaggcttcc 3780
tcccctccca atgcggttta aaacataaat aaaaaaccag actctgtttg gatttggatc 3840
aagcaagtgt cttgctgtct ttatttaggg gttttgcgcg cgcggtaggc ccgggaccag 3900
cggtctcggt cgttgagggt cctgtgtatt ttttccagga cgtggtaaag gtgactctgg 3960
atgttcagat acatgggcat aagcccgtct ctggggtgga ggtagcacca ctgcagagct 4020
tcatgctgcg gggtggtgtt gtagatgatc cagtcgtagc aggagcgctg ggcgtggtgc 4080
ctaaaaatgt ctttcagtag caagctgatt gccaggggca ggcccttggt gtaagtgttt 4140
acaaagcggt taagctggga tgggtgcata cgtggggata tgagatgcat cttggactgt 4200
atttttaggt tggctatgtt cccagccata tccctccggg gattcatgtt gtgcagaacc 4260
accagcacag tgtatccggt gcacttggga aatttgtcat gtagcttaga aggaaatgcg 4320
tggaagaact tggagacgcc cttgtgacct ccaagatttt ccatgcattc gtccataatg 4380
atggcaatgg gcccacgggc ggcggcctgg gcgaagatat ttctgggatc actaacgtca 4440
tagttgtgtt ccaggatgag atcgtcatag gccatttta caaagcgcgg gcggagggtg 4500
ccagactgcg gtataatggt tccatccggc ccaggggcgt agttaccctc acagatttgc 4560
atttcccacg ctttgagttc agatgggggg atcatgtcta cctgcggggc gatgaagaaa 4620
acggtttccg gggtagggga gatcagctgg gaagaaagca ggttcctgag cagctgcgac 4680
ttaccgcagc cggtgggccc gtaaatcaca cctattaccg gctgcaactg gtagttaaga 4740
gagctgcagc tgccgtcatc cctgagcagg ggggccactt cgttaagcat gtccctgact 4800
cgcatgtttt ccctgaccaa atccgccaga aggcgctcgc cgcccagcga tagcagttct 4860
tgcaaggaag caaagttttt caacggtttg agaccgtccg ccgtaggcat gcttttgagc 4920
gtttgaccaa gcagttccag gcggtcccac agctcggtca cctgctctac ggcatctcga 4980
tccagcatat ctcctcgttt cgcgggttgg ggcggctttc gctgtacggc agtagtcggt 5040
gctcgtccag acgggccagg gtcatgtctt tccacgggcg cagggtcctc gtcagcgtag 5100
tctgggtcac ggtgaagggg tgcgctccgg gctgcgcgct ggccagggtg cgcttgaggc 5160
tggtcctgct ggtgctgaag cgctgccggt cttcgccctg cgcgtcggcc aggtagcatt 5220
tgaccatggt gtcatagtcc agcccctccg cggcgtggcc cttggcgcgc agcttgccct 5280
tggaggaggc gccgcacgag gggcagtgca gacttttgag ggcgtagagc ttgggcgcga 5340

gaaataccga ttccggggag taggcatccg cgccgcaggc cccgcagacg gtctcgcatt 5400
ccacgagcca ggtgagctct ggccgttcgg ggtcaaaaac caggtttccc ccatgctttt 5460
tgatgcgttt cttacctctg gtttccatga gccggtgtcc acgctcggtg acgaaaaggc 5520
tgtccgtgtc cccgtataca gacttgagag gcctgtcctc gagcggtgtt ccgcggtcct 5580
cctcgtatag aaactcggac cactctgaga caaaggctcg cgtccaggcc agcacgaagg 5640
aggctaagtg ggaggggtag cggtcgttgt ccactagggg gtccactcgc tccagggtgt 5700
gaagacacat gtcgccctct tcggcatcaa ggaaggtgat tggtttgtag gtgtaggcca 5760
cgtgaccggg tgttcctgaa ggggggctat aaaaggggct gggggcgcgt tcgtcctcac 5820
tctcttccgc atcgctgtct gcgagggcca gctgttgggg tgagtcgacg cgaggctgga 5880
tggccttccc cattatgatt cttctcgctt ccggcggcat cgggatgccc gcgttgcagg 5940
ccatgctgtc caggcaggta gatgacgacc atcagggaca gcttcaaggc cagcaaaagg 6000
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 6060
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 6120
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 6180
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 6240
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 6300
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 6360
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 6420
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaaggacag 6480
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 6540
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 6600
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 6660
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 6720
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 6780
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 6840
ttcgttcatc catagttgcc tgactccccg tcgtgtagat aactacgata cgggagggct 6900
taccatctgg ccccagtgct gcaatgatac cgcgagaccc acgctcaccg gctccagatt 6960
tatcagcaat aaaccagcca gccggaaggg ccgagcgcag aagtggtcct gcaactttat 7020
ccgcctccat ccagtctatt aattgttgcc gggaagctag agtaagtagt tcgccagtta 7080
atagtttgcg caacgttgtt gccattgctg caggcatcgt ggtgtcacgc tcgtcgtttg 7140
gtatggcttc attcagctcc ggttcccaac gatcaaggcg agttacatga tcccccatgt 7200
tgtgcaaaaa agcggttagc tccttcggtc ctccgatcgt tgtcagaagt aagttggccg 7260
cagtgttatc actcatggtt atggcagcac tgcataattc tcttactgtc atgccatccg 7320
taagatgctt ttctgtgact ggtgagtact caaccaagtc attctgagaa tagtgtatgc 7380
ggcgaccgag ttgctcttgc ccggcgtcaa cacgggataa taccgcgcca catagcagaa 7440
ctttaaaagt gctcatcatt ggaaaacgtt cttcggggcg aaaactctca aggatcttac 7500
cgctgttgag atccagttcg atgtaaccca ctcgtgcacc caactgatct tcagcatctt 7560
ttactttcac cagcgtttct gggtgagcaa aaacaggaag gcaaaatgcc gcaaaaaagg 7620
gaataagggc gacacggaaa tgttgaatac tcatactctt cctttttcaa tattattgaa 7680
gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata 7740
aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc taagaaacca 7800
ttattatcat gacattaacc tataaaaata ggcgtatcac gaggcccttt cgtcttcaag 7860
aattgtt 7867

<210> 43
<211> 7870
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 43

ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg ttttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcgctagc accagctgca 1800
acaccagcgt gatcacccag gcctgccccа aggtgagctt cgagcccatc cccaaccact 1860
actgcgcccc cgccggcttc gccatcctga agtgcaagga caagaagttc aacggcaagg 1920
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 1980
cccagctgct gctgaacggt agcctggccg aggaggaggt ggtgatccgc agcgctaact 2040
tcgccgacaa cgccaaggtg atcatcgtgc agctgaacga gagcgtggag atcaactgca 2100
cccgccccaa caacaacacc cgcaagagca tccacatcgg ccccggccgc gccttctaca 2160
ccaccggcga gatcatcggc gacatccgcc aggcccactg caacctgagc cgcgccaagt 2220
ggaacgacac cctgaacaag atcgtgatca agctgcgcga gcagttcggc aacaagacca 2280
tcgtgttcaa gcacagcagc ggcggcgacc ccgagatcgt gacccacagc ttcaactgcg 2340
gcggcgagtt cttctactgc aacagcgcta gcctgccctg ccgcatcaag cagatcatca 2400
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 2460
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 2520
gcgagatctt ccgtccgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 2580
agtacaaggt ggtgaagatc gagcccctgg gcgtggcccc caccaaggcc aagcttaccg 2640
tccaggcccg ccagctgctg agcggcatcg tgcagcagca gaacaacctg ctgcgcgcca 2700
tcgaggccca gcagcacctg ctgcagctga ccgtgtgggg catcaagcag ctgcaggccc 2760
gcaccctggc cgtggagcgc tacctgaagg accagcagca gctcgagcag atctggaacc 2820
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 2880
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 2940
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtga ggatccagat 3000
ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctcccccgtg ccttccttga 3060
ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 3120
gtctgagtag gtgtcattct attctggggg gtggggtggg gcagcacagc aaggggggagg 3180
attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt acccagggcc 3240
gcataacttc gtataatgta tgctatacga agttataaga tctgtactga aatgtgtggg 3300

cgtggcttaa gggtgggaaa gaatatataa ggtgggggtc ttatgtagtt ttgtatctgt 3360
tttgcagcag ccgccgccgc catgagcacc aactcgtttg atggaagcat tgtgagctca 3420
tatttgacaa cgcgcatgcc cccatgggcc ggggtgcgtc agaatgtgat gggctccagc 3480
attgatggtc gccccgtcct gcccgcaaac tctactacct tgacctacga gaccgtgtct 3540
ggaacgccgt tggagactgc agcctccgcc gccgcttcag ccgctgcagc caccgcccgc 3600
gggattgtga ctgactttgc tttcctgagc ccgcttgcaa gcagtgcagc ttcccgttca 3660
tccgcccgcg atgacaagtt gacggctctt ttggcacaat tggattcttt gacccgggaa 3720
cttaatgtcg tttctcagca gctgttggat ctgcgccagc aggtttctgc cctgaaggct 3780
tcctcccctc ccaatgcggt ttaaaacata aataaaaaac cagactctgt ttggatttgg 3840
atcaagcaag tgtcttgctg tctttattta ggggttttgc gcgcgcggta ggcccgggac 3900
cagcggtctc ggtcgttgag ggtcctgtgt attttttcca ggacgtggta aaggtgactc 3960
tggatgttca gatacatggg cataagcccg tctctggggt ggaggtagca ccactgcaga 4020
gcttcatgct gcggggtggt gttgtagatg atccagtcgt agcaggagcg ctgggcgtgg 4080
tgcctaaaaa tgtctttcag tagcaagctg attgccaggg gcaggccctt ggtgtaagtg 4140
tttacaaagc ggttaagctg ggatgggtgc atacgtgggg atatgagatg catcttggac 4200
tgtattttta ggttggctat gttcccagcc atatccctcc ggggattcat gttgtgcaga 4260
accaccagca cagtgtatcc ggtgcacttg ggaaatttgt catgtagctt agaaggaaat 4320
gcgtggaaga acttggagac gcccttgtga cctccaagat tttccatgca ttcgtccata 4380
atgatggcaa tgggcccacg ggcggcggcc tgggcgaaga tatttctggg atcactaacg 4440
tcatagttgt gttccaggat gagatcgtca taggccattt ttacaaagcg cgggcggagg 4500
gtgccagact gcggtataat ggttccatcc ggcccagggg cgtagttacc ctcacagatt 4560
tgcatttccc acgctttgag ttcagatggg gggatcatgt ctacctgcgg ggcgatgaag 4620
aaaacggttt ccggggtagg ggagatcagc tgggaagaaa gcaggttcct gagcagctgc 4680
gacttaccgc agccggtggg cccgtaaatc acacctatta ccggctgcaa ctggtagtta 4740
agagagctgc agctgccgtc atccctgagc agggggggcca cttcgttaag catgtccctg 4800
actcgcatgt tttccctgac caaatccgcc agaaggcgct cgccgcccag cgatagcagt 4860
tcttgcaagg aagcaaagtt tttcaacggt ttgagaccgt ccgccgtagg catgcttttg 4920
agcgtttgac caagcagttc caggcggtcc cacagctcgg tcacctgctc tacggcatct 4980
cgatccagca tatctcctcg tttcgcgggt tggggcggct ttcgctgtac ggcagtagtc 5040
ggtgctcgtc cagacgggcc agggtcatgt ctttccacgg gcgcagggtc ctcgtcagcg 5100
tagtctgggt cacggtgaag gggtgcgctc cgggctgcgc gctggccagg gtgcgcttga 5160
ggctggtcct gctggtgctg aagcgctgcc ggtcttcgcc ctgcgcgtcg gccaggtagc 5220
atttgaccat ggtgtcatag tccagcccct ccgcggcgtg gccccttggcg cgcagcttgc 5280
ccttggagga ggcgccgcac gaggggcagt gcagactttt gagggcgtag agcttgggcg 5340
cgagaaatac cgattccggg gagtaggcat ccgcgccgca ggccccgcag acggtctcgc 5400
attccacgag ccaggtgagc tctggccgtt cggggtcaaa aaccaggttt cccccatgct 5460
ttttgatgcg tttcttacct ctggtttcca tgagccggtg tccacgctcg gtgacgaaaa 5520
ggctgtccgt gtccccgtat acagacttga gaggcctgtc ctcgagcggt gttccgcggt 5580
cctcctcgta tagaaactcg gaccactctg agacaaaggc tcgcgtccag gccagcacga 5640
aggaggctaa gtgggagggg tagcggtcgt tgtccactag ggggtccact cgctccaggg 5700
tgtgaagaca catgtcgccc tcttcggcat caaggaaggt gattggtttg taggtgtagg 5760
ccacgtgacc gggtgttcct gaaggggggc tataaaaggg ggtgggggcg cgttcgtcct 5820
cactctcttc cgcatcgctg tctgcgaggg ccagctgttg gggtgagtcg acgcgaggct 5880
ggatggcctt ccccattatg attcttctcg cttccggcgg catcgggatg cccgcgttgc 5940
aggccatgct gtccaggcag gtagatgacg accatcaggg acagcttcaa ggccagcaaa 6000
aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg 6060
acgagcatca caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa 6120
gataccaggc gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc 6180
ttaccggata cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac 6240
gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac 6300
ccccgttca gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg 6360
taagacacga cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt 6420
atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagga 6480
cagtatttgg tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct 6540
cttgatccgg caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga 6600

ttacgcgcag aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg 6660
ctcagtggaa cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct 6720
tcacctagat ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt 6780
aaacttggtc tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc 6840
tatttcgttc atccatagtt gcctgactcc ccgtcgtgta gataactacg atacgggagg 6900
gcttaccatc tggccccagt gctgcaatga taccgcgaga cccacgctca ccggctccag 6960
atttatcagc aataaaccag ccagccggaa gggccgagcg cagaagtggt cctgcaactt 7020
tatccgcctc catccagtct attaattgtt gccgggaagc tagagtaagt agttcgccag 7080
ttaatagttt gcgcaacgtt gttgccattg ctgcaggcat cgtggtgtca cgctcgtcgt 7140
ttggtatggc ttcattcagc tccggttccc aacgatcaag gcgagttaca tgatccccca 7200
tgttgtgcaa aaaagcggtt agctccttcg gtcctccgat cgttgtcaga agtaagttgg 7260
ccgcagtgtt atcactcatg gttatggcag cactgcataa ttctcttact gtcatgccat 7320
ccgtaagatg cttttctgtg actggtgagt actcaaccaa gtcattctga gaatagtgta 7380
tgcggcgacc gagttgctct tgcccggcgt caacacggga taataccgcg ccacatagca 7440
gaactttaaa agtgctcatc attggaaaac gttcttcggg gcgaaaactc tcaaggatct 7500
taccgctgtt gagatccagt tcgatgtaac ccactcgtgc acccaactga tcttcagcat 7560
cttttacttt caccagcgtt tctgggtgag caaaaacagg aaggcaaaat gccgcaaaaa 7620
agggaataag ggcgacacgg aaatgttgaa tactcatact cttccttttt caatattatt 7680
gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt atttagaaaa 7740
ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac gtctaagaaa 7800
ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc tttcgtcttc 7860
aagaattgtt 7870

<210> 44
<211> 7885
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 44
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260

cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcaacatc agcaccagca 1800
tccgcggcaa ggtgcagaag gagtacgcct tcttctacaa gctggacatc atccccatcg 1860
acaacgacac caccagctac agcctgacca gctgcaacac cagcgtgatc acccaggcct 1920
gccccaaggt gagcttcgag cccatcccca accactactg cgcccccgcc ggcttcgcca 1980
tcctgaagtg caaggacaag aagttcaacg gcaagggccc ctgcaccaac gtgagcaccg 2040
tgcagtgcac ccacggcatc cgccccgtgg tgagcaccca gctgctgctg aacggtagcc 2100
tggccgagga ggaggtggtg atccgcagcg ctaacttcgc cgacaacgcc aaggtgatca 2160
tcgtgcagct gaacgagagc gtggagatca actgcacccg cgctagcgcc cactgcaacc 2220
tgagccgcgc caagtggaac gacaccctga acaagatcgt gatcaagctg cgcgagcagt 2280
tcggcaacaa gaccatcgtg ttcaagcaca gcagcggcgg cgaccccgag atcgtgaccc 2340
acagcttcaa ctgcggcggc gagttcttct actgcaacag cgctagcctg ccctgccgca 2400
tcaagcagat catcaacatg tggcagaagg tgggcaaggc catgtacgcc ccccccatca 2460
gcggccagat ccgctgcagc agcaacatca ccggcctgct gctgacccgc gacggcggca 2520
acagcaacaa cgagagcgag atcttccgtc cgggcggcgg cgacatgcgc gacaactggc 2580
gcagcgagct gtacaagtac aaggtggtga agatcgagcc cctgggcgtg gcccccacca 2640
aggccaagct taccgtccag gcccgccagc tgctgagcgg catcgtgcag cagcagaaca 2700
acctgctgcg cgccatcgag gcccagcagc acctgctgca gctgaccgtg tggggcatca 2760
agcagctgca ggcccgcacc ctggccgtgg agcgctacct gaaggaccag cagcagctcg 2820
agcagatctg gaaccacacc acctggatgg agtgggaccg cgagatcaac aactacacca 2880
gcctgatcca cagcctgatc gaggagagcc agaaccagca ggagaagaac gagcaggagc 2940
tgctggagct ggacaagtgg gccagcctgt ggaactggtt caacatcacc aactggctgt 3000
ggtgaggatc cagatctgct gtgccttcta gttgccagcc atctgttgtt tgcccctccc 3060
ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa taaaatgagg 3120
aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg gtggggcagc 3180
acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg gtgggctcta 3240
tgggtaccca gggccgcata acttcgtata atgtatgcta tacgaagtta taagatctgt 3300
actgaaatgt gtgggcgtgg cttaagggtg ggaaagaata tataaggtgg gggtcttatg 3360
tagttttgta tctgttttgc agcagccgcc gccgccatga gcaccaactc gtttgatgga 3420
agcattgtga gctcatattt gacaacgcgc atgcccccat gggccggggt gcgtcagaat 3480
gtgatgggct ccagcattga tggtcgcccc gtcctgcccg caaactctac taccttgacc 3540
tacgagaccg tgtctggaac gccgttggag actgcagcct ccgccgccgc ttcagccgct 3600
gcagccaccg cccgcgggat tgtgactgac tttgctttcc tgagcccgct tgcaagcagt 3660
gcagcttccc gttcatccgc ccgcgatgac aagttgacgg ctcttttggc acaattggat 3720
tctttgaccc gggaacttaa tgtcgtttct cagcagctgt tggatctgcg ccagcaggtt 3780
tctgccctga aggcttcctc ccctcccaat gcggtttaaa acataaataa aaaaccagac 3840
tctgtttgga tttggatcaa gcaagtgtct tgctgtcttt atttaggggt tttgcgcgcg 3900
cggtaggccc gggaccagcg gtctcggtcg ttgagggtcc tgtgtatttt ttccaggacg 3960
tggtaaaggt gactctggat gttcagatac atgggcataa gcccgtctct ggggtggagg 4020
tagcaccact gcagagcttc atgctgcggg gtggtgttgt agatgatcca gtcgtagcag 4080
gagcgctggg cgtggtgcct aaaaatgtct ttcagtagca agctgattgc caggggcagg 4140
cccttggtgt aagtgtttac aaagcggtta agctgggatg ggtgcatacg tggggatatg 4200
agatgcatct tggactgtat ttttaggttg gctatgttcc cagccatatc cctccgggga 4260
ttcatgttgt gcagaaccac cagcacagtg tatccggtgc acttgggaaa tttgtcatgt 4320
agcttagaag gaaatgcgtg gaagaacttg gagacgccct tgtgacctcc aagattttcc 4380
atgcattcgt ccataatgat ggcaatgggc ccacgggcgg cggcctgggc gaagatattt 4440
ctgggatcac taacgtcata gttgtgttcc aggatgagat cgtcataggc catttttaca 4500
aagcgcgggc ggagggtgcc agactgcggt ataatggttc catccggccc aggggcgtag 4560

ttaccctcac agatttgcat ttcccacgct ttgagttcag atggggggat catgtctacc 4620
tgcggggcga tgaagaaaac ggtttccggg gtaggggaga tcagctggga agaaagcagg 4680
ttcctgagca gctgcgactt accgcagccg gtgggcccgt aaatcacacc tattaccggc 4740
tgcaactggt agttaagaga gctgcagctg ccgtcatccc tgagcagggg ggccacttcg 4800
ttaagcatgt ccctgactcg catgttttcc ctgaccaaat ccgccagaag gcgctcgccg 4860
cccagcgata gcagttcttg caaggaagca aagtttttca acggtttgag accgtccgcc 4920
gtaggcatgc ttttgagcgt ttgaccaagc agttccaggc ggtcccacag ctcggtcacc 4980
tgctctacgg catctcgatc cagcatatct cctcgtttcg cgggttgggg cggctttcgc 5040
tgtacggcag tagtcggtgc tcgtccagac gggccagggt catgtctttc cacgggcgca 5100
gggtcctcgt cagcgtagtc tgggtcacgg tgaaggggtg cgctccgggc tgcgcgctgg 5160
ccagggtgcg cttgaggctg gtcctgctgg tgctgaagcg ctgccggtct tcgccctgcg 5220
cgtcggccag gtagcatttg accatggtgt catagtccag cccctccgcg gcgtggccct 5280
tggcgcgcag cttgcccttg gaggaggcgc cgcacgaggg gcagtgcaga cttttgaggg 5340
cgtagagctt gggcgcgaga aataccgatt ccggggagta ggcatccgcg ccgcaggccc 5400
cgcagacggt ctcgcattcc acgagccagg tgagctctgg ccgttcgggg tcaaaaacca 5460
ggtttccccc atgcttttg atgcgtttct tacctctggt ttccatgagc cggtgtccac 5520
gctcggtgac gaaaaggctg tccgtgtccc cgtatacaga cttgagaggc ctgtcctcga 5580
gcggtgttcc gcggtcctcc tcgtatagaa actcggacca ctctgagaca aaggctcgcg 5640
tccaggccag cacgaaggag gctaagtggg aggggtagcg gtcgttgtcc actagggggt 5700
ccactcgctc cagggtgtga agacacatgt cgccctcttc ggcatcaagg aaggtgattg 5760
gtttgtaggt gtaggccacg tgaccgggtg ttcctgaagg ggggctataa aagggggtgg 5820
gggcgcgttc gtcctcactc tcttccgcat cgctgtctgc gagggccagc tgttggggtg 5880
agtcgacgcg aggctggatg gccttcccca ttatgattct tctcgcttcc ggcggcatcg 5940
ggatgcccgc gttgcaggcc atgctgtcca ggcaggtaga tgacgaccat cagggacagc 6000
ttcaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata 6060
ggctccgccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc 6120
cgacaggact ataaagatac caggcgtttc cccctggaag ctccctcgtg cgctctcctg 6180
ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc 6240
tttctcatag ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc tccaagctgg 6300
gctgtgtgca cgaacccccc gttcagcccg accgctgcgc cttatccggt aactatcgtc 6360
ttgagtccaa cccggtaaga cacgacttat cgccactggc agcagccact ggtaacagga 6420
ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtggtgg cctaactacg 6480
gctacactag aaggacagta tttggtatct gcgctctgct gaagccagtt accttcggaa 6540
aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggt ggtttttttg 6600
tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt 6660
ctacggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat 6720
tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct 6780
aaagtatata tgagtaaact tggtctgaca gttaccaatg cttaatcagt gaggcaccta 6840
tctcagcgat ctgtctattt cgttcatcca tagttgcctg actccccgtc gtgtagataa 6900
ctacgatacg ggagggctta ccatctggcc ccagtgctgc aatgataccg cgagacccac 6960
gctcaccggc tccagattta tcagcaataa accagccagc cggaagggcc gagcgcagaa 7020
gtggtcctgc aactttatcc gcctccatcc agtctattaa ttgttgccgg gaagctagag 7080
taagtagttc gccagttaat agtttgcgca acgttgttgc cattgctgca ggcatcgtgg 7140
tgtcacgctc gtcgtttggt atggcttcat tcagctccgg ttcccaacga tcaaggcgag 7200
ttacatgatc ccccatgttg tgcaaaaaag cggttagctc cttcggtcct ccgatcgttg 7260
tcagaagtaa gttggccgca gtgttatcac tcatggttat ggcagcactg cataattctc 7320
ttactgtcat gccatccgta agatgctttt ctgtgactgg tgagtactca accaagtcat 7380
tctgagaata gtgtatgcgg cgaccgagtt gctcttgccc ggcgtcaaca cgggataata 7440
ccgcgccaca tagcagaact ttaaaagtgc tcatcattgg aaaacgttct tcggggcgaa 7500
aactctcaag gatcttaccg ctgttgagat ccagttcgat gtaacccact cgtgcaccca 7560
actgatcttc agcatctttt actttcacca gcgtttctgg gtgagcaaaa acaggaaggc 7620
aaaatgccgc aaaaaaggga ataagggcga cacggaaatg ttgaatactc atactcttcc 7680
tttttcaata ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg 7740
aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac 7800
ctgacgtcta agaaaccatt attatcatga cattaaccta taaaaatagg cgtatcacga 7860

ggccctttcg tcttcaagaa ttgtt 7885

<210> 45
<211> 7789
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 45
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaccagctg caacaccagc gtgatcaccc 1740
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 1800
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 1860
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 1920
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 1980
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcgct agcgcccact 2040
gcaacctgag ccgcgccaag tggaacgaca ccctgaacaa gatcgtgatc aagctgcgcg 2100
agcagttcgg caacaagacc atcgtgttca agcacagcag cggcggcgac cccgagatcg 2160
tgacccacag cttcaactgc ggcggcgagt tcttctactg caacagcacc cagctgttca 2220
acagcacctg gttcaacagc acctggagca ccgagggcag caacaacacc gagggcagcg 2280
acaccatcac cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 2340
aggccatgta cgccccccc atcagcggcc agatccgctg cagcagcaac atcaccggcc 2400
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 2460
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 2520

agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 2580
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 2640
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 2700
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 2760
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 2820
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 2880
ggttcaacat caccaactgg ctgtggtgag gatccagatc tgctgtgcct tctagttgcc 2940
agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt gccactccca 3000
ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg tgtcattcta 3060
ttctgggggg tggggtgggg cagcacagca aggggggagga ttgggaagac aatagcaggc 3120
atgctgggga tgcggtgggc tctatgggta cccagggccg cataacttcg tataatgtat 3180
gctatacgaa gttataagat ctgtactgaa atgtgtgggc gtggcttaag ggtgggaaag 3240
aatatataag gtgggggtct tatgtagttt tgtatctgtt ttgcagcagc cgccgccgcc 3300
atgagcacca actcgtttga tggaagcatt gtgagctcat atttgacaac gcgcatgccc 3360
ccatgggccg gggtgcgtca gaatgtgatg ggctccagca ttgatggtcg ccccgtcctg 3420
cccgcaaact ctactacctt gacctacgag accgtgtctg gaacgccgtt ggagactgca 3480
gcctccgccg ccgcttcagc cgctgcagcc accgcccgcg ggattgtgac tgactttgct 3540
ttcctgagcc cgcttgcaag tagtgcagct tcccgttcat ccgcccgcga tgacaagttg 3600
acggctcttt tggcacaatt ggattctttg acccgggaac ttaatgtcgt ttctcagcag 3660
ctgttggatc tgcgccagca ggtttctgcc ctgaaggctt cctcccctcc caatgcggtt 3720
taaaacataa ataaaaaacc agactctgtt tggatttgga tcaagcaagt gtcttgctgt 3780
ctttatttag gggttttgcg cgcgcggtag gcccgggacc agcggtctcg gtcgttgagg 3840
gtcctgtgta ttttttccag gacgtggtaa aggtgactct ggatgttcag atacatgggc 3900
ataagcccgt ctctggggtg gaggtagcac cactgcagag cttcatgctg cggggtggtg 3960
ttgtagatga tccagtcgta gcaggagcgc tgggcgtggt gcctaaaaat gtctttcagt 4020
agcaagctga ttgccagggg caggcccttg gtgtaagtgt ttacaaagcg gttaagctgg 4080
gatgggtgca tacgtgggga tatgagatgc atcttggact gtatttttag gttggctatg 4140
ttcccagcca tatccctccg gggattcatg ttgtgcagaa ccaccagcac agtgtatccg 4200
gtgcacttgg gaaatttgtc atgtagctta gaaggaaatg cgtggaagaa cttggagacg 4260
cccttgtgac ctccaagatt ttccatgcat tcgtccataa tgatggcaat gggcccacgg 4320
gcggcggcct gggcgaagat atttctggga tcactaacgt catagttgtg ttccaggatg 4380
agatcgtcat aggccatttt tacaaagcgc gggcggaggg tgccagactg cggtataatg 4440
gttccatccg gcccaggggc gtagttaccc tcacagattt gcatttccca cgctttgagt 4500
tcagatgggg ggatcatgtc tacctgcggg gcgatgaaga aaacggtttc cggggtaggg 4560
gagatcagct gggaagaaag caggttcctg agcagctgcg acttaccgca gccggtgggc 4620
ccgtaaatca cacctattac cggctgcaac tggtagttaa gagagctgca gctgccgtca 4680
tccctgagca ggggggccac ttcgttaagc atgtccctga ctcgcatgtt ttccctgacc 4740
aaatccgcca gaaggcgctc gccgcccagc gatagcagtt cttgcaagga agcaaagttt 4800
ttcaacggtt tgagaccgtc cgccgtaggc atgcttttga gcgtttgacc aagcagttcc 4860
aggcggtccc acagctcggt cacctgctct acggcatctc gatccagcat atctcctcgt 4920
ttcgcgggtt ggggcggctt tcgctgtacg gcagtagtcg gtgctcgtcc agacgggcca 4980
gggtcatgtc tttccacggg cgcagggtcc tcgtcagcgt agtctgggtc acggtgaagg 5040
ggtgcgctcc gggctgcgcg ctggccaggg tgcgcttgag gctggtcctg ctggtgctga 5100
agcgctgccg gtcttcgccc tgcgcgtcgg ccaggtagca tttgaccatg gtgtcatagt 5160
ccagcccctc cgcggcgtgg cccttggcgc gcagcttgcc cttggaggag gcgccgcacg 5220
aggggcagtg cagacttttg agggcgtaga gcttgggcgc gagaaatacc gattccgggg 5280
agtaggcatc cgcgccgcag gccccgcaga cggtctcgca ttccacgagc caggtgagct 5340
ctggccgttc ggggtcaaaa accaggtttc ccccatgctt tttgatgcgt ttcttacctc 5400
tggtttccat gagccggtgt ccacgctcgg tgacgaaaag gctgtccgtg tccccgtata 5460
cagacttgag aggcctgtcc tcgagcggtg ttccgcggtc ctcctcgtat agaaactcgg 5520
accactctga gacaaaggct cgcgtccagg ccagcacgaa ggaggctaag tgggaggggt 5580
agcggtcgtt gtccactagg gggtccactc gctccagggt gtgaagacac atgtcgccct 5640
cttcggcatc aaggaaggtg attggtttgt aggtgtaggc cacgtgaccg ggtgttcctg 5700
aaggggggct ataaaagggg gtgggggcgc gttcgtcctc actctcttcc gcatcgctgt 5760
ctgcgagggc cagctgttgg ggtgagtcga cgcgaggctg gatggccttc cccattatga 5820

ttcttctcgc ttccggcggc atcgggatgc ccgcgttgca ggccatgctg tccaggcagg 5880
tagatgacga ccatcaggga cagcttcaag gccagcaaaa ggccaggaac cgtaaaaagg 5940
ccgcgttgct ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac 6000
gctcaagtca gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg 6060
gaagctccct cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct 6120
ttctcccttc gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg 6180
tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct 6240
gcgccttatc cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac 6300
tggcagcagc cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt 6360
tcttgaagtg gtggcctaac tacggctaca ctagaaggac agtatttggt atctgcgctc 6420
tgctgaagcc agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca 6480
ccgctggtag cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat 6540
ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac 6600
gttaagggat tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt 6660
aaaaatgaag ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc 6720
aatgcttaat cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg 6780
cctgactccc cgtcgtgtag ataactacga tacgggaggg cttaccatct ggccccagtg 6840
ctgcaatgat accgcgagac ccacgctcac cggctccaga tttatcagca ataaaccagc 6900
cagccggaag ggccgagcgc agaagtggtc ctgcaacttt atccgcctcc atccagtcta 6960
ttaattgttg ccgggaagct agagtaagta gttcgccagt taatagtttg cgcaacgttg 7020
ttgccattgc tgcaggcatc gtggtgtcac gctcgtcgtt tggtatggct tcattcagct 7080
ccggttccca acgatcaagg cgagttacat gatcccccat gttgtgcaaa aaagcggtta 7140
gctccttcgg tcctccgatc gttgtcagaa gtaagttggc cgcagtgtta tcactcatgg 7200
ttatggcagc actgcataat tctcttactg tcatgccatc cgtaagatgc ttttctgtga 7260
ctggtgagta ctcaaccaag tcattctgag aatagtgtat gcggcgaccg agttgctctt 7320
gcccggcgtc aacacgggat aataccgcgc cacatagcag aactttaaaa gtgctcatca 7380
ttggaaaacg ttcttcgggg cgaaaactct caaggatctt accgctgttg agatccagtt 7440
cgatgtaacc cactcgtgca cccaactgat cttcagcatc ttttactttc accagcgttt 7500
ctgggtgagc aaaaacagga aggcaaaatg ccgcaaaaaa gggaataagg gcgacacgga 7560
aatgttgaat actcatactc ttccttttc aatattattg aagcatttat cagggttatt 7620
gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata ggggttccgc 7680
gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc atgacattaa 7740
cctataaaaa taggcgtatc acgaggccct ttcgtcttca agaattgtt 7789

<210> 46
<211> 7792
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 46
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600

ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaccagctg caacaccagc gtgatcaccc 1740
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 1800
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 1860
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 1920
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 1980
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 2040
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 2100
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2160
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2220
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 2280
gcaacagcgc tagcctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 2340
gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 2400
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 2460
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 2520
tcgagccccc gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 2580
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 2640
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 2700
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 2760
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 2820
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 2880
actggttcaa catcaccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 2940
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3000
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3060
ctattctggg gggtggggtg gggcagcaca gcaaggggga ggattgggaa gacaatagca 3120
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggg ccgcataact tcgtataatg 3180
tatgctatac gaagttataa gatctgtact gaaatgtgtg ggcgtggctt aagggtggga 3240
aagaatatat aaggtggggg tcttatgtag ttttgtatct gttttgcagc agccgccgcc 3300
gccatgagca ccaactcgtt tgatggaagc attgtgagct catatttgac aacgcgcatg 3360
cccccatggg ccggggtgcg tcagaatgtg atgggctcca gcattgatgg tcgccccgtc 3420
ctgcccgcaa actctactac cttgacctac gagaccgtgt ctggaacgcc gttggagact 3480
gcagcctccg ccgccgcttc agccgctgca gccaccgccc gcgggattgt gactgacttt 3540
gctttcctga gcccgcttgc aagcagtgca gcttcccgtt catccgcccg cgatgacaag 3600
ttgacggctc ttttggcaca attggattct ttgacccggg aacttaatgt cgtttctcag 3660
cagctgttgg atctgcgcca gcaggtttct gccctgaagg cttcctcccc tcccaatgcg 3720
gtttaaaaca taaataaaaa accagactct gtttggattt ggatcaagca agtgtcttgc 3780
tgtctttatt taggggtttt gcgcgcgcgg taggcccggg accagcggtc tcggtcgttg 3840
agggtcctgt gtatttttc caggacgtgg taaaggtgac tctggatgtt cagatacatg 3900

ggcataagcc cgtctctggg gtggaggtag caccactgca gagcttcatg ctgcggggtg 3960
gtgttgtaga tgatccagtc gtagcaggag cgctgggcgt ggtgcctaaa aatgtctttc 4020
agtagcaagc tgattgccag gggcaggccc ttggtgtaag tgtttacaaa gcggttaagc 4080
tgggatgggt gcatacgtgg ggatatgaga tgcatcttgg actgtatttt taggttggct 4140
atgttcccag ccatatccct ccggggattc atgttgtgca gaaccaccag cacagtgtat 4200
ccggtgcact tgggaaattt gtcatgtagc ttagaaggaa atgcgtggaa gaacttggag 4260
acgcccttgt gacctccaag attttccatg cattcgtcca taatgatggc aatgggccca 4320
cgggcggcgg cctgggcgaa gatatttctg ggatcactaa cgtcatagtt gtgttccagg 4380
atgagatcgt cataggccat ttttacaaag cgcgggcgga gggtgccaga ctgcggtata 4440
atggttccat ccggcccagg ggcgtagtta ccctcacaga tttgcatttc ccacgctttg 4500
agttcagatg gggggatcat gtctacctgc ggggcgatga agaaaacggt ttccggggta 4560
ggggagatca gctgggaaga aagcaggttc ctgagcagct gcgacttacc gcagccggtg 4620
ggcccgtaaa tcacacctat taccggctgc aactggtagt taagagagct gcagctgccg 4680
tcatccctga gcagggggge cacttcgtta agcatgtccc tgactcgcat gttttccctg 4740
accaaatccg ccagaaggcg ctcgccgccc agcgatagca gttcttgcaa ggaagcaaag 4800
tttttcaacg gtttgagacc gtccgccgta ggcatgcttt tgagcgtttg accaagcagt 4860
tccaggcggt cccacagctc ggtcacctgc tctacggcat ctcgatccag catatctcct 4920
cgtttcgcgg gttggggcgg ctttcgctgt acggcagtag tcggtgctcg tccagacggg 4980
ccagggtcat gtctttccac gggcgcaggg tcctcgtcag cgtagtctgg gtcacggtga 5040
aggggtgcgc tccgggctgc gcgctggcca gggtgcgctt gaggctggtc ctgctggtgc 5100
tgaagcgctg ccggtcttcg ccctgcgcgt cggccaggta gcatttgacc atggtgtcat 5160
agtccagccc ctccgcggcg tggcccttgg cgcgcagctt gcccttggag gaggcgccgc 5220
acgaggggca gtgcagactt ttgagggcgt agagcttggg cgcgagaaat accgattccg 5280
gggagtaggc atccgcgccg caggccccgc agacggtctc gcattccacg agccaggtga 5340
gctctggccg ttcggggtca aaaaccaggt ttcccccatg ctttttgatg cgtttcttac 5400
ctctggtttc catgagccgg tgtccacgct cggtgacgaa aaggctgtcc gtgtccccgt 5460
atacagactt gagaggcctg tcctcgagcg gtgttccgcg gtcctcctcg tatagaaact 5520
cggaccactc tgagacaaag gctcgcgtcc aggccagcac gaaggaggct aagtgggagg 5580
ggtagcggtc gttgtccact agggggtcca ctcgctccag ggtgtgaaga cacatgtcgc 5640
cctcttcggc atcaaggaag gtgattggtt tgtaggtgta ggccacgtga ccgggtgttc 5700
ctgaaggggg gctataaaag ggggtggggg cgcgttcgtc ctcactctct tccgcatcgc 5760
tgtctgcgag ggccagctgt tggggtgagt cgacgcgagg ctggatggcc ttccccatta 5820
tgattcttct cgcttccggc ggcatcggga tgcccgcgtt gcaggccatg ctgtccaggc 5880
aggtagatga cgaccatcag ggacagcttc aaggccagca aaaggccagg aaccgtaaaa 5940
aggccgcgtt gctggcgttt ttccataggc tccgcccccc tgacgagcat cacaaaaatc 6000
gacgctcaag tcagaggtgg cgaaacccga caggactata aagataccag gcgtttcccc 6060
ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc gcttaccgga tacctgtccg 6120
cctttctccc ttcgggaagc gtggcgcttt ctcatagctc acgctgtagg tatctcagtt 6180
cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga acccccgtt cagcccgacc 6240
gctgcgcctt atccggtaac tatcgtcttg agtccaaccc ggtaagacac gacttatcgc 6300
cactggcagc agccactggt aacaggatta gcagagcgag gtatgtaggc ggtgctacag 6360
agttcttgaa gtggtggcct aactacggct acactagaag gacagtattt ggtatctgcg 6420
ctctgctgaa gccagttacc ttcggaaaaa gagttggtag ctcttgatcc ggcaaacaaa 6480
ccaccgctgg tagcggtggt ttttttgttt gcaagcagca gattacgcgc agaaaaaaag 6540
gatctcaaga agatcctttg atcttttcta cggggtctga cgctcagtgg aacgaaaact 6600
cacgttaagg gattttggtc atgagattat caaaaaggat cttcacctag atccttttaa 6660
attaaaaatg aagttttaaa tcaatctaaa gtatatatga gtaaacttgg tctgacagtt 6720
accaatgctt aatcagtgag gcacctatct cagcgatctg tctatttcgt tcatccatag 6780
ttgcctgact ccccgtcgtg tagataacta cgatacggga gggcttacca tctggcccca 6840
gtgctgcaat gataccgcga gacccacgct caccggctcc agatttatca gcaataaacc 6900
agccagccgg aagggccgag cgcagaagtg gtcctgcaac tttatccgcc tccatccagt 6960
ctattaattg ttgccgggaa gctagagtaa gtagttcgcc agttaatagt ttgcgcaacg 7020
ttgttgccat tgctgcaggc atcgtggtgt cacgctcgtc gtttggtatg gcttcattca 7080
gctccggttc ccaacgatca aggcgagtta catgatcccc catgttgtgc aaaaaagcgg 7140
ttagctcctt cggtcctccg atcgttgtca gaagtaagtt ggccgcagtg ttatcactca 7200

tggttatggc agcactgcat aattctctta ctgtcatgcc atccgtaaga tgcttttctg 7260
tgactggtga gtactcaacc aagtcattct gagaatagtg tatgcggcga ccgagttgct 7320
cttgcccggc gtcaacacgg gataataccg cgccacatag cagaacttta aaagtgctca 7380
tcattggaaa acgttcttcg gggcgaaaac tctcaaggat cttaccgctg ttgagatcca 7440
gttcgatgta acccactcgt gcacccaact gatcttcagc atcttttact ttcaccagcg 7500
tttctgggtg agcaaaaaca ggaaggcaaa atgccgcaaa aaagggaata agggcgacac 7560
ggaaatgttg aatactcata ctcttccttt ttcaatatta ttgaagcatt tatcagggtt 7620
attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa ataggggttc 7680
cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat 7740
taacctataa aaataggcgt atcacgaggc cctttcgtct tcaagaattg tt 7792

<210> 47
<211> 7828
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 47
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaagaactg cagcttcaac atcagcacca 1740
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 1800
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 1860
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 1920
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 1980

ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2040
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2100
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgcgctagc gcccactgca 2160
acctgagccg cgccaagtgg aacgacaccc tgaacaagat cgtgatcaag ctgcgcgagc 2220
agttcggcaa caagaccatc gtgttcaagc acagcagcgg cggcgacccc gagatcgtga 2280
cccacagctt caactgcggc ggcgagttct tctactgcaa cagcgctagc ctgccctgcc 2340
gcatcaagca gatcatcaac atgtggcaga aggtgggcaa ggccatgtac gccccccca 2400
tcagcggcca gatccgctgc agcagcaaca tcaccggcct gctgctgacc cgcgacggcg 2460
gcaacagcaa caacgagagc gagatcttcc gtccgggcgg cggcgacatg cgcgacaact 2520
ggcgcagcga gctgtacaag tacaaggtgg tgaagatcga gcccctgggc gtggccccca 2580
ccaaggccaa gcttaccgtc caggcccgcc agctgctgag cggcatcgtg cagcagcaga 2640
acaacctgct gcgcgccatc gaggcccagc agcacctgct gcagctgacc gtgtggggca 2700
tcaagcagct gcaggcccgc accctggccg tggagcgcta cctgaaggac cagcagcagc 2760
tcgagcagat ctggaaccac accacctgga tggagtggga ccgcgagatc aacaactaca 2820
ccagcctgat ccacagcctg atcgaggaga gccagaacca gcaggagaag aacgagcagg 2880
agctgctgga gctggacaag tgggccagcc tgtggaactg gttcaacatc accaactggc 2940
tgtggtgagg atccagatct gctgtgcctt ctagttgcca gccatctgtt gtttgccct 3000
cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc taataaaatg 3060
aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggt ggggtggggc 3120
agcacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat gcggtgggct 3180
ctatgggtac ccagggccgc ataacttcgt ataatgtatg ctatacgaag ttataagatc 3240
tgtactgaaa tgtgtgggcg tggcttaagg gtgggaaaga atatataagg tgggggtctt 3300
atgtagtttt gtatctgttt tgcagcagcc gccgccgcca tgagcaccaa ctcgtttgat 3360
ggaagcattg tgagctcata tttgacaacg cgcatgcccc catgggccgg ggtgcgtcag 3420
aatgtgatgg gctccagcat tgatggtcgc cccgtcctgc ccgcaaactc tactaccttg 3480
acctacgaga ccgtgtctgg aacgccgttg gagactgcag cctccgccgc cgcttcagcc 3540
gctgcagcca ccgcccgcgg gattgtgact gactttgctt tcctgagccc gcttgcaagc 3600
agtgcagctt cccgttcatc cgcccgcgat gacaagttga cggctctttt ggcacaattg 3660
gattctttga cccgggaact taatgtcgtt tctcagcagc tgttggatct gcgccagcag 3720
gtttctgccc tgaaggcttc ctcccctccc aatgcggttt aaaacataaa taaaaaacca 3780
gactctgttt ggatttggat caagcaagtg tcttgctgtc tttatttagg ggttttgcgc 3840
gcgcggtagg cccgggacca gcggtctcgg tcgttgaggg tcctgtgtat tttttccagg 3900
acgtggtaaa ggtgactctg gatgttcaga tacatgggca taagcccgtc tctggggtgg 3960
aggtagcacc actgcagagc ttcatgctgc ggggtggtgt tgtagatgat ccagtcgtag 4020
caggagcgct gggcgtggtg cctaaaaatg tctttcagta gcaagctgat tgccaggggc 4080
aggcccttgg tgtaagtgtt tacaaagcgg ttaagctggg atgggtgcat acgtggggat 4140
atgagatgca tcttggactg tatttttagg ttggctatgt tcccagccat atccctccgg 4200
ggattcatgt tgtgcagaac caccagcaca gtgtatccgg tgcacttggg aaatttgtca 4260
tgtagcttag aaggaaatgc gtggaagaac ttggagacgc ccttgtgacc tccaagattt 4320
tccatgcatt cgtccataat gatggcaatg ggcccacggg cggcggcctg ggcgaagata 4380
tttctgggat cactaacgtc atagttgtgt tccaggatga gatcgtcata ggccattttt 4440
acaaagcgcg ggcggagggt gccagactgc ggtataatgg ttccatccgg cccaggggcg 4500
tagttaccct cacagatttg catttcccac gctttgagtt cagatggggg gatcatgtct 4560
acctgcgggg cgatgaagaa aacggtttcc ggggtagggg agatcagctg ggaagaaagc 4620
aggttcctga gcagctgcga cttaccgcag ccggtgggcc cgtaaatcac acctattacc 4680
ggctgcaact ggtagttaag agagctgcag ctgccgtcat ccctgagcag gggggccact 4740
tcgttaagca tgtccctgac tcgcatgttt tccctgacca aatccgccag aaggcgctcg 4800
ccgcccagcg atagcagttc ttgcaaggaa gcaaagtttt tcaacggttt gagaccgtcc 4860
gccgtaggca tgcttttgag cgtttgacca agcagttcca ggcggtccca cagctcggtc 4920
acctgctcta cggcatctcg atccagcata tctcctcgtt tcgcgggttg gggcggcttt 4980
cgctgtacgg cagtagtcgg tgctcgtcca gacgggccag ggtcatgtct ttccacgggc 5040
gcagggtcct cgtcagcgta gtctgggtca cggtgaaggg gtgcgctccg ggctgcgcgc 5100
tggccagggt gcgcttgagg ctggtcctgc tggtgctgaa gcgctgccgg tcttcgccct 5160
gcgcgtcggc caggtagcat ttgaccatgg tgtcatagtc cagcccctcc gcggcgtggc 5220
ccttggcgcg cagcttgccc ttggaggagg cgccgcacga ggggcagtgc agacttttga 5280

gggcgtagag cttgggcgcg agaaataccg attccgggga gtaggcatcc gcgccgcagg 5340
ccccgcagac ggtctcgcat tccacgagcc aggtgagctc tggccgttcg gggtcaaaaa 5400
ccaggtttcc cccatgcttt ttgatgcgtt tcttacctct ggtttccatg agccggtgtc 5460
cacgctcggt gacgaaaagg ctgtccgtgt ccccgtatac agacttgaga ggcctgtcct 5520
cgagcggtgt tccgcggtcc tcctcgtata gaaactcgga ccactctgag acaaaggctc 5580
gcgtccaggc cagcacgaag gaggctaagt gggaggggta gcggtcgttg tccactaggg 5640
ggtccactcg ctccagggtg tgaagacaca tgtcgccctc ttcggcatca aggaaggtga 5700
ttggtttgta ggtgtaggcc acgtgaccgg gtgttcctga aggggggcta taaaaggggg 5760
tgggggcgcg ttcgtcctca ctctcttccg catcgctgtc tgcgagggcc agctgttggg 5820
gtgagtcgac gcgaggctgg atggccttcc ccattatgat tcttctcgct tccggcggca 5880
tcgggatgcc cgcgttgcag gccatgctgt ccaggcaggt agatgacgac catcagggac 5940
agcttcaagg ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc 6000
ataggctccg ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa 6060
acccgacagg actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc 6120
ctgttccgac cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg 6180
cgctttctca tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc 6240
tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc 6300
gtcttgagtc caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca 6360
ggattagcag agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact 6420
acggctacac tagaaggaca gtatttggta tctgcgctct gctgaagcca gttaccttcg 6480
gaaaaagagt tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt 6540
ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct 6600
tttctacggg gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga 6660
gattatcaaa aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa 6720
tctaaagtat atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac 6780
ctatctcagc gatctgtcta tttcgttcat ccatagttgc ctgactcccc gtcgtgtaga 6840
taactacgat acgggagggc ttaccatctg gccccagtgc tgcaatgata ccgcgagacc 6900
cacgctcacc ggctccagat ttatcagcaa taaaccagcc agccggaagg gccgagcgca 6960
gaagtggtcc tgcaacttta tccgcctcca tccagtctat taattgttgc cgggaagcta 7020
gagtaagtag ttcgccagtt aatagtttgc gcaacgttgt tgccattgct gcaggcatcg 7080
tggtgtcacg ctcgtcgttt ggtatggctt cattcagctc cggttcccaa cgatcaaggc 7140
gagttacatg atcccccatg ttgtgcaaaa aagcggttag ctccttcggt cctccgatcg 7200
ttgtcagaag taagttggcc gcagtgttat cactcatggt tatggcagca ctgcataatt 7260
ctcttactgt catgccatcc gtaagatgct tttctgtgac tggtgagtac tcaaccaagt 7320
cattctgaga atagtgtatg cggcgaccga gttgctcttg cccggcgtca acacgggata 7380
ataccgcgcc acatagcaga actttaaaag tgctcatcat tggaaaacgt tcttcggggc 7440
gaaaactctc aaggatctta ccgctgttga gatccagttc gatgtaaccc actcgtgcac 7500
ccaactgatc ttcagcatct tttactttca ccagcgtttc tgggtgagca aaaacaggaa 7560
ggcaaaatgc cgcaaaaaag ggaataaggg cgacacggaa atgttgaata ctcatactct 7620
tccttttca atattattga agcatttatc agggttattg tctcatgagc ggatacatat 7680
ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc 7740
cacctgacgt ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca 7800
cgaggccctt tcgtcttcaa gaattgtt 7828

<210> 48
<211> 7789
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 48

ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380
tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacctga agaacgacac caacaccaac agcagcagcg 1740
gccgcatgat catggagaag ggcgagatca agaactgcag cttcgctagc accagctgca 1800
acaccagcgt gatcacccag gcctgcccca aggtgagctt cgagcccatc cccaaccact 1860
actgcgcccc cgccggcttc gccatcctga agtgcaagga caagaagttc aacggcaagg 1920
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 1980
cccagctgct gctgaacggt agcctggccg aggaggaggt ggtgatccgc agcgctaact 2040
tcgccgacaa cgccaaggtg atcatcgtgc agctgaacga gagcgtggag atcaactgca 2100
cccgcgctag cgcccactgc aacctgagcc gcgccaagtg gaacgacacc ctgaacaaga 2160
tcgtgatcaa gctgcgcgag cagttcggca acaagaccat cgtgttcaag cacagcagcg 2220
gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc ttctactgca 2280
acagcgctag cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 2340
aggccatgta cgccccccc atcagcggcc agatccgctg cagcagcaac atcaccggcc 2400
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 2460
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 2520
agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 2580
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 2640
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 2700
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 2760
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 2820
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 2880
ggttcaacat caccaactgg ctgtggtgag gatccagatc tgctgtgcct tctagttgcc 2940
agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt gccactccca 3000
ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg tgtcattcta 3060
ttctgggggg tggggtgggg cagcacagca aggggggagga ttgggaagac aatagcaggc 3120
atgctgggga tgcggtgggc tctatgggta cccagggccg cataacttcg tataatgtat 3180
gctatacgaa gttataagat ctgtactgaa atgtgtgggc gtggcttaag ggtgggaaag 3240
aatatataag gtgggggtct tatgtagttt tgtatctgtt ttgcagcagc cgccgccgcc 3300

atgagcacca actcgtttga tggaagcatt gtgagctcat atttgacaac gcgcatgccc 3360
ccatgggccg gggtgcgtca gaatgtgatg ggctccagca ttgatggtcg ccccgtcctg 3420
cccgcaaact ctactacctt gacctacgag accgtgtctg gaacgccgtt ggagactgca 3480
gcctccgccg ccgcttcagc cgctgcagcc accgcccgcg ggattgtgac tgactttgct 3540
ttcctgagcc cgcttgcaag cagtgcagct tcccgttcat ccgcccgcga tgacaagttg 3600
acggctcttt tggcacaatt ggattctttg acccgggaac ttaatgtcgt ttctcagcag 3660
ctgttggatc tgcgccagca ggtttctgcc ctgaaggctt cctcccctcc caatgcggtt 3720
taaaacataa ataaaaaacc agactctgtt tggatttgga tcaagcaagt gtcttgctgt 3780
ctttatttag gggttttgcg cgcgcggtag gcccgggacc agcggtctcg gtcgttgagg 3840
gtcctgtgta ttttttccag gacgtggtaa aggtgactct ggatgttcag atacatgggc 3900
ataagcccgt ctctggggtg gaggtagcac cactgcagag cttcatgctg cggggtggtg 3960
ttgtagatga tccagtcgta gcaggagcgc tgggcgtggt gcctaaaaat gtctttcagt 4020
agcaagctga ttgccagggg caggcccttg gtgtaagtgt ttacaaagcg gttaagctgg 4080
gatgggtgca tacgtgggga tatgagatgc atcttggact gtatttttag gttggctatg 4140
ttcccagcca tatccctccg gggattcatg ttgtgcagaa ccaccagcac agtgtatccg 4200
gtgcacttgg gaaatttgtc atgtagctta gaaggaaatg cgtggaagaa cttggagacg 4260
cccttgtgac ctccaagatt ttccatgcat tcgtccataa tgatggcaat gggcccacgg 4320
gcggcggcct gggcgaagat atttctggga tcactaacgt catagttgtg ttccaggatg 4380
agatcgtcat aggccatttt tacaaagcgc gggcggaggg tgccagactg cggtataatg 4440
gttccatccg gcccaggggc gtagttaccc tcacagattt gcatttccca cgctttgagt 4500
tcagatgggg ggatcatgtc tacctgcggg gcgatgaaga aaacggtttc cggggtaggg 4560
gagatcagct gggaagaaag caggttcctg agcagctgcg acttaccgca gccggtgggc 4620
ccgtaaatca cacctattac cggctgcaac tggtagttaa gagagctgca gctgccgtca 4680
tccctgagca ggggggccac ttcgttaagc atgtccctga ctcgcatgtt ttccctgacc 4740
aaatccgcca gaaggcgctc gccgcccagc gatagcagtt cttgcaagga agcaaagttt 4800
ttcaacggtt tgagaccgtc cgccgtaggc atgcttttga gcgtttgacc aagcagttcc 4860
aggcggtccc acagctcggt cacctgctct acggcatctc gatccagcat atctcctcgt 4920
ttcgcgggtt ggggcggctt tcgctgtacg gcagtagtcg gtgctcgtcc agacgggcca 4980
gggtcatgtc tttccacggg cgcagggtcc tcgtcagcgt agtctgggtc acggtgaagg 5040
ggtgcgctcc gggctgcgcg ctggccaggg tgcgcttgag gctggtcctg ctggtgctga 5100
agcgctgccg gtcttcgccc tgcgcgtcgg ccaggtagca tttgaccatg gtgtcatagt 5160
ccagcccctc cgcggcgtgg cccttggcgc gcagcttgcc cttggaggag gcgccgcacg 5220
aggggcagtg cagacttttg agggcgtaga gcttgggcgc gagaaatacc gattccgggg 5280
agtaggcatc cgcgccgcag gccccgcaga cggtctcgca ttccacgagc caggtgagct 5340
ctggccgttc ggggtcaaaa accaggtttc ccccatgctt tttgatgcgt ttcttacctc 5400
tggtttccat gagccggtgt ccacgctcgg tgacgaaaag gctgtccgtg tccccgtata 5460
cagacttgag aggcctgtcc tcgagcggtg ttccgcggtc ctcctcgtat agaaactcgg 5520
accactctga gacaaaggct cgcgtccagg ccagcacgaa ggaggctaag tgggaggggt 5580
agcggtcgtt gtccactagg gggtccactc gctccagggt gtgaagacac atgtcgccct 5640
cttcggcatc aaggaaggtg attggtttgt aggtgtaggc cacgtgaccg ggtgttcctg 5700
aaggggggct ataaaagggg gtgggggcgc gttcgtcctc actctcttcc gcatcgctgt 5760
ctgcgagggc cagctgttgg ggtgagtcga cgcgaggctg gatggccttc cccattatga 5820
ttcttctcgc ttccggcggc atcgggatgc ccgcgttgca ggccatgctg tccaggcagg 5880
tagatgacga ccatcaggga cagcttcaag gccagcaaaa ggccaggaac cgtaaaaagg 5940
ccgcgttgct ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac 6000
gctcaagtca gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg 6060
gaagctccct cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct 6120
ttctcccttc gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg 6180
tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct 6240
gcgccttatc cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac 6300
tggcagcagc cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt 6360
tcttgaagtg gtggcctaac tacggctaca ctagaaggac agtatttggt atctgcgctc 6420
tgctgaagcc agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca 6480
ccgctggtag cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat 6540
ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac 6600

gttaagggat tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt 6660
aaaaatgaag ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc 6720
aatgcttaat cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg 6780
cctgactccc cgtcgtgtag ataactacga tacgggaggg cttaccatct ggccccagtg 6840
ctgcaatgat accgcgagac ccacgctcac cggctccaga tttatcagca ataaaccagc 6900
cagccggaag ggccgagcgc agaagtggtc ctgcaacttt atccgcctcc atccagtcta 6960
ttaattgttg ccgggaagct agagtaagta gttcgccagt taatagtttg cgcaacgttg 7020
ttgccattgc tgcaggcatc gtggtgtcac gctcgtcgtt tggtatggct tcattcagct 7080
ccggttccca acgatcaagg cgagttacat gatcccccat gttgtgcaaa aaagcggtta 7140
gctccttcgg tcctccgatc gttgtcagaa gtaagttggc cgcagtgtta tcactcatgg 7200
ttatggcagc actgcataat tctcttactg tcatgccatc cgtaagatgc ttttctgtga 7260
ctggtgagta ctcaaccaag tcattctgag aatagtgtat gcggcgaccg agttgctctt 7320
gcccggcgtc aacacgggat aataccgcgc cacatagcag aactttaaaa gtgctcatca 7380
ttggaaaacg ttcttcgggg cgaaaactct caaggatctt accgctgttg agatccagtt 7440
cgatgtaacc cactcgtgca cccaactgat cttcagcatc ttttactttc accagcgttt 7500
ctgggtgagc aaaaacagga aggcaaaatg ccgcaaaaaa gggaataagg gcgacacgga 7560
aatgttgaat actcatactc ttcctttttc aatattattg aagcatttat cagggttatt 7620
gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata ggggttccgc 7680
gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc atgacattaa 7740
cctataaaaa taggcgtatc acgaggccct ttcgtcttca agaattgtt 7789

<210> 49
<211> 7711
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pAdApt containing HIV genes

<400> 49
ttaattaacc gcaattctca tgtttgacag cttatcatca tcaataatat accttatttt 60
ggattgaagc caatatgata atgaggggt ggagtttgtg acgtggcgcg gggcgtggga 120
acggggcggg tgacgtagta gtgtggcgga agtgtgatgt tgcaagtgtg gcggaacaca 180
tgtaagcgac ggatgtggca aaagtgacgt ttttggtgtg cgccggtgta cacaggaagt 240
gacaattttc gcgcggtttt aggcggatgt tgtagtaaat ttgggcgtaa ccgagtaaga 300
tttggccatt ttcgcgggaa aactgaataa gaggaagtga aatctgaata attttgtgtt 360
actcatagcg cgtaatattt gtctagggcc gcggggactt tgaccgttta cgtggagact 420
cgcccaggtg tttttctcag gtgttttccg cgttccgggt caaagttggc gttttattat 480
tatagtcagt acgtaccagt gcactggcct agagcggccc cattgcatac gttgtatcca 540
tatcataata tgtacattta tattggctca tgtccaacat taccgccatg ttgacattga 600
ttattgacta gttattaata gtaatcaatt acggggtcat tagttcatag cccatatatg 660
gagttccgcg ttacataact tacggtaaat ggcccgcctg gctgaccgcc caacgacccc 720
cgcccattga cgtcaataat gacgtatgtt cccatagtaa cgccaatagg gactttccat 780
tgacgtcaat gggtggagta tttacggtaa actgcccact tggcagtaca tcaagtgtat 840
catatgccaa gtacgccccc tattgacgtc aatgacggta aatggcccgc ctggcattat 900
gcccagtaca tgaccttatg ggactttcct acttggcagt acatctacgt attagtcatc 960
gctattacca tggtgatgcg gttttggcag tacatcaatg ggcgtggata gcggtttgac 1020
tcacggggat ttccaagtct ccaccccatt gacgtcaatg ggagtttgtt ttggcaccaa 1080
aatcaacggg actttccaaa atgtcgtaac aactccgccc cattgacgca aatgggcggt 1140
aggcgtgtac ggtgggaggt ctatataagc agagctcgtt tagtgaaccg tcagatcgcc 1200
tggagacgcc atccacgctg ttttgacctc catagaagac accgggaccg atccagcctc 1260
cgtcaccgtc gtcgacacgt gtgatcagat atcgcggccg ctctagaatg cgcgtgaagg 1320
agaagtacca gcacctgtgg cgctggggct ggcgctgggg caccatgctg ctgggcatgc 1380

tgatgatctg cagcgccacc gagaagctgt gggtgaccgt gtactacggc gtgcccgtgt 1440
ggaaggaggc caccaccacc ctgctctgcg ccagcgacgc caaggcctac gacaccgagg 1500
tgcacaacgt gtgggccacc cacgcctgcg tgcccaccga ccccaacccc caggaggtgg 1560
tgctggtgaa cgtgaccgag aacttcgaca tgtggaagaa cgacatggtg gagcagatgc 1620
acgaggacat catcagcctg tgggaccaga gcctgaagcc ctgcgtgaag ctgacccccc 1680
tgtgcgtgag cctgaagtgc accgacgcta gcaccagctg caacaccagc gtgatcaccc 1740
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 1800
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 1860
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 1920
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 1980
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcgct agcgcccact 2040
gcaacctgag ccgcgccaag tggaacgaca ccctgaacaa gatcgtgatc aagctgcgcg 2100
agcagttcgg caacaagacc atcgtgttca agcacagcag cggcggcgac cccgagatcg 2160
tgacccacag cttcaactgc ggcggcgagt tcttctactg caacagcgct agcctgccct 2220
gccgcatcaa gcagatcatc aacatgtggc agaaggtggg caaggccatg tacgcccccc 2280
ccatcagcgg ccagatccgc tgcagcagca acatcaccgg cctgctgctg acccgcgacg 2340
gcggcaacag caacaacgag agcgagatct tccgtccggg cggcggcgac atgcgcgaca 2400
actggcgcag cgagctgtac aagtacaagg tggtgaagat cgagcccctg ggcgtggccc 2460
ccaccaaggc caagcttacc gtccaggccc gccagctgct gagcggcatc gtgcagcagc 2520
agaacaacct gctgcgcgcc atcgaggccc agcagcacct gctgcagctg accgtgtggg 2580
gcatcaagca gctgcaggcc cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc 2640
agctcgagca gatctggaac cacaccacct ggatggagtg ggaccgcgag atcaacaact 2700
acaccagcct gatccacagc ctgatcgagg agagccagaa ccagcaggag aagaacgagc 2760
aggagctgct ggagctggac aagtgggcca gcctgtggaa ctggttcaac atcaccaact 2820
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 2880
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 2940
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3000
ggcagcacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3060
gctctatggg tacccagggc cgcataactt cgtataatgt atgctatacg aagttataag 3120
atctgtactg aaatgtgtgg gcgtggctta agggtgggaa agaatatata aggtgggggt 3180
cttatgtagt tttgtatctg ttttgcagca gccgccgccg ccatgagcac caactcgttt 3240
gatggaagca ttgtgagctc atatttgaca acgcgcatgc ccccatgggc cggggtgcgt 3300
cagaatgtga tgggctccag cattgatggt cgccccgtcc tgcccgcaaa ctctactacc 3360
ttgacctacg agaccgtgtc tggaacgccg ttggagactg cagcctccgc cgccgcttca 3420
gccgctgcag ccaccgcccg cgggattgtg actgactttg ctttcctgag cccgcttgca 3480
agcagtgcag cttcccgttc atccgcccgc gatgacaagt tgacggctct tttggcacaa 3540
ttggattctt tgacccggga acttaatgtc gtttctcagc agctgttgga tctgcgccag 3600
caggtttctg ccctgaaggc ttcctcccct cccaatgcgg tttaaaacat aaataaaaaa 3660
ccagactctg tttggatttg gatcaagcaa gtgtcttgct gtctttattt aggggttttg 3720
cgcgcgcggt aggcccggga ccagcggtct cggtcgttga gggtcctgtg tatttttcc 3780
aggacgtggt aaaggtgact ctggatgttc agatacatgg gcataagccc gtctctgggg 3840
tggaggtagc accactgcag agcttcatgc tgcggggtgg tgttgtagat gatccagtcg 3900
tagcaggagc gctgggcgtg gtgcctaaaa atgtctttca gtagcaagct gattgccagg 3960
ggcaggccct tggtgtaagt gtttacaaag cggttaagct gggatgggtg catacgtggg 4020
gatatgagat gcatcttgga ctgtattttt aggttggcta tgttcccagc catatccctc 4080
cggggattca tgttgtgcag aaccaccagc acagtgtatc cggtgcactt gggaaatttg 4140
tcatgtagct tagaaggaaa tgcgtggaag aacttggaga cgcccttgtg acctccaaga 4200
ttttccatgc attcgtccat aatgatggca atgggcccac gggcggcggc ctgggcgaag 4260
atatttctgg gatcactaac gtcatagttg tgttccagga tgagatcgtc ataggccatt 4320
tttacaaagc gcgggcggag ggtgccagac tgcggtataa tggttccatc cggcccaggg 4380
gcgtagttac cctcacagat ttgcatttcc cacgctttga gttcagatgg ggggatcatg 4440
tctacctgcg gggcgatgaa gaaaacggtt tccggggtag gggagatcag ctgggaagaa 4500
agcaggttcc tgagcagctg cgacttaccg cagccggtgg gcccgtaaat cacacctatt 4560
accggctgca actggtagtt aagagagctg cagctgccgt catccctgag cagggggcc 4620
acttcgttaa gcatgtccct gactcgcatg ttttccctga ccaaatccgc cagaaggcgc 4680

tcgccgccca gcgatagcag ttcttgcaag gaagcaaagt ttttcaacgg tttgagaccg 4740
tccgccgtag gcatgctttt gagcgtttga ccaagcagtt ccaggcggtc ccacagctcg 4800
gtcacctgct ctacggcatc tcgatccagc atatctcctc gtttcgcggg ttggggcggc 4860
tttcgctgta cggcagtagt cggtgctcgt ccagacgggc cagggtcatg tctttccacg 4920
ggcgcagggt cctcgtcagc gtagtctggg tcacggtgaa ggggtgcgct ccgggctgcg 4980
cgctggccag ggtgcgcttg aggctggtcc tgctggtgct gaagcgctgc cggtcttcgc 5040
cctgcgcgtc ggccaggtag catttgacca tggtgtcata gtccagcccc tccgcggcgt 5100
ggcccttggc gcgcagcttg cccttggagg aggcgccgca cgaggggcag tgcagacttt 5160
tgagggcgta gagcttgggc gcgagaaata ccgattccgg ggagtaggca tccgcgccgc 5220
aggccccgca gacggtctcg cattccacga gccaggtgag ctctggccgt tcggggtcaa 5280
aaaccaggtt tcccccatgc tttttgatgc gtttcttacc tctggtttcc atgagccggt 5340
gtccacgctc ggtgacgaaa aggctgtccg tgtccccgta tacagacttg agaggcctgt 5400
cctcgagcgg tgttccgcgg tcctcctcgt atagaaactc ggaccactct gagacaaagg 5460
ctcgcgtcca ggccagcacg aaggaggcta agtgggaggg gtagcggtcg ttgtccacta 5520
gggggtccac tcgctccagg gtgtgaagac acatgtcgcc ctcttcggca tcaaggaagg 5580
tgattggttt gtaggtgtag gccacgtgac cgggtgttcc tgaaggggggg ctataaaagg 5640
gggtgggggc gcgttcgtcc tcactctctt ccgcatcgct gtctgcgagg gccagctgtt 5700
ggggtgagtc gacgcgaggc tggatggcct tccccattat gattcttctc gcttccggcg 5760
gcatcgggat gcccgcgttg caggccatgc tgtccaggca ggtagatgac gaccatcagg 5820
gacagcttca aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 5880
tccataggct ccgccccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 5940
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 6000
ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 6060
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 6120
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact 6180
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 6240
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 6300
actacggcta cactagaagg acagtatttg gtatctgcgc tctgctgaag ccagttacct 6360
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 6420
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 6480
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 6540
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 6600
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 6660
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc cccgtcgtgt 6720
agataactac gatacgggag ggcttaccat ctggccccag tgctgcaatg ataccgcgag 6780
acccacgctc accggctcca gatttatcag caataaacca gccagccgga agggccgagc 6840
gcagaagtgg tcctgcaact ttatccgcct ccatccagtc tattaattgt tgccgggaag 6900
ctagagtaag tagttcgcca gttaatagtt tgcgcaacgt tgttgccatt gctgcaggca 6960
tcgtggtgtc acgctcgtcg tttggtatgg cttcattcag ctccggttcc caacgatcaa 7020
ggcgagttac atgatccccc atgttgtgca aaaaagcggt tagctccttc ggtcctccga 7080
tcgttgtcag aagtaagttg gccgcagtgt tatcactcat ggttatggca gcactgcata 7140
attctcttac tgtcatgcca tccgtaagat gcttttctgt gactggtgag tactcaacca 7200
agtcattctg agaatagtgt atgcggcgac cgagttgctc ttgcccggcg tcaacacggg 7260
ataataccgc gccacatagc agaactttaa aagtgctcat cattggaaaa cgttcttcgg 7320
ggcgaaaact ctcaaggatc ttaccgctgt tgagatccag ttcgatgtaa cccactcgtg 7380
cacccaactg atcttcagca tcttttactt tcaccagcgt ttctgggtga gcaaaaacag 7440
gaaggcaaaa tgccgcaaaa aagggaataa gggcgacacg gaaatgttga atactcatac 7500
tcttcctttt tcaatattat tgaagcattt atcagggtta ttgtctcatg agcggataca 7560
tatttgaatg tatttagaaa aataaacaaa taggggttcc gcgcacattt ccccgaaaag 7620
tgccacctga cgtctaagaa accattatta tcatgacatt aacctataaa aataggcgta 7680
tcacgaggcc ctttcgtctt caagaattgt t 7711

<210> 50

<211> 6577
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 50
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag gctagcagcc tgaagtgcac cgacctgaag 2040
aacgacacca acaccaacag cagcagcggc cgcatgatca tggagaaggg cgagatcaag 2100
aactgcagct tcaacatcag caccagcatc cgcggcaagg tgcagaagga gtacgccttc 2160
ttctacaagc tggacatcat ccccatcgac aacgacacca ccagctacag cctgaccagc 2220
tgcaacacca gcgtgatcac ccaggcctgc cccaaggtga gcttcgagcc catccccaac 2280
cactactgcg cccccgccgg cttcgccatc ctgaagtgca aggacaagaa gttcaacggc 2340
aagggccccc gcaccaacgt gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg 2400
agcacccagc tgctgctgaa cggtagcctg gccgaggagg aggtggtgat ccgcagcgct 2460
aacttcgccg acaacgccaa ggtgatcatc gtgcagctga acgagagcgt ggagatcaac 2520
tgcacccgcc ccaacaacaa cacccgcaag agcatccaca tcggcccccgg ccgcgccttc 2580
tacaccaccg gcgagatcat cggcgacatc cgccaggccc actgcaacct gagccgcgcc 2640
aagtggaacg acaccctgaa caagatcgtg atcaagctgc gcgagcagtt cggcaacaag 2700
accatcgtgt tcaagcacag cagcggcggc gaccccgaga tcgtgaccca cagcttcaac 2760
tgcggcggcg agttcttcta ctgcaacagc acccagctgt tcaacagcac ctggttcaac 2820

agcacctgga gcaccgaggg cagcaacaac accgagggca gcgacaccat caccctgccc 2880
tgccgcatca agcagatcat caacatgtgg cagaaggtgg gcaaggccat gtacgccccc 2940
cccatcagcg gccagatccg ctgcagcagc aacatcaccg gcctgctgct gacccgcgac 3000
ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg gcggcggcga catgcgcgac 3060
aactggcgca gcgagctgta caagtacaag gtggtgaaga tcgagccccc gggcgtggcc 3120
cccaccaagg ccaagcttac cgtccaggcc cgccagctgc tgagcggcat cgtgcagcag 3180
cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc tgctgcagct gaccgtgtgg 3240
ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc gctacctgaa ggaccagcag 3300
cagctcgagc agatctggaa ccacaccacc tggatggagt gggaccgcga gatcaacaac 3360
tacaccagcc tgatccacag cctgatcgag gagagccaga accagcacga gaagaacgag 3420
caggagctgc tggagctgga caagtgggcc agcctgtgga actggttcaa catcaccaac 3480
tggctgtggt acatcaagct gttcatcatg atcgtgggcg gcctggtggg cctgcgcatc 3540
gtgttcgccg tgctgagcat ctgaggatcc agatctgctg tgccttctag ttgccagcca 3600
tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac tcccactgtc 3660
ctttcctaat aaaatgagga aattgcatcg cattgtctga gtaggtgtca ttctattctg 3720
gggggtgggg tggggcagga cagcaagggg gaggattggg aagacaatag caggcatgct 3780
ggggatgcgg tgggctctat gggtacccag gtgctgaaga attgacccgg ttcctcctgg 3840
gccagaaaga agcaggcaca tccccttctc tgtgacacac cctgtccacg cccctggttc 3900
ttagttccag ccccactcat aggacactca tagctcagga gggctccgcc ttcaatccca 3960
cccgctaaag tacttggagc ggtctctccc tccctcatca gcccaccaaa ccaaacctag 4020
cctccaagag tgggaagaaa ttaaagcaag ataggctatt aagtgcagag ggagagaaaa 4080
tgcctccaac atgtgaggaa gtaatgagag aaatcataga attttaaggc catcatggcc 4140
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4200
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4260
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4320
ggcgtttttc cataggctcc gccccctga cgagcatcac aaaaatcgac gctcaagtca 4380
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4440
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4500
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4560
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4620
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4680
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4740
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4800
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4860
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4920
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 4980
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5040
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5100
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5160
ggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5220
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5280
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5340
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5400
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5460
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5520
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5580
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5640
aatttccgct cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5700
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5760
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5820
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5880
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 5940
tctaatacct ggaatgctgt tttccgggg atcgcagtgg tgagtaacca tgcatcatca 6000
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6060
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6120

tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6180
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6240
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6300
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6360
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6420
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6480
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6540
acctataaaa ataggcgtat cacgaggccc tttcgtc 6577

<210> 51
<211> 6577
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 51
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100

accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccgc tagcatcaac 2520
tgcacccgcc ccaacaacaa cacccgcaag agcatccaca tcggccccgg ccgcgccttc 2580
tacaccaccg gcgagatcat cggcgacatc cgccaggccc actgcaacct gagccgcgcc 2640
aagtggaacg acaccctgaa caagatcgtg atcaagctgc gcgagcagtt cggcaacaag 2700
accatcgtgt tcaagcacag cagcggcggc gaccccgaga tcgtgaccca cagcttcaac 2760
tgcggcggcg agttcttcta ctgcaacagc acccagctgt tcaacagcac ctggttcaac 2820
agcacctgga gcaccgaggg cagcaacaac accgagggca gcgacaccat caccctgccc 2880
tgccgcatca agcagatcat caacatgtgg cagaaggtgg gcaaggccat gtacgccccc 2940
cccatcagcg gccagatccg ctgcagcagc aacatcaccg gcctgctgct gacccgcgac 3000
ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg gcggcggcga catgcgcgac 3060
aactggcgca gcgagctgta caagtacaag gtggtgaaga tcgagccccc gggcgtggcc 3120
cccaccaagg ccaagcttac cgtccaggcc cgccagctgc tgagcggcat cgtgcagcag 3180
cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc tgctgcagct gaccgtgtgg 3240
ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc gctacctgaa ggaccagcag 3300
cagctcgagc agatctggaa ccacaccacc tggatggagt gggaccgcga gatcaacaac 3360
tacaccagcc tgatccacag cctgatcgag gagagccaga accagcacga gaagaacgag 3420
caggagctgc tggagctgga caagtgggcc agcctgtgga actggttcaa catcaccaac 3480
tggctgtggt acatcaagct gttcatcatg atcgtgggcg gcctggtggg cctgcgcatc 3540
gtgttcgccg tgctgagcat ctgaggatcc agatctgctg tgccttctag ttgccagcca 3600
tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac tcccactgtc 3660
ctttcctaat aaaatgagga aattgcatcg cattgtctga gtaggtgtca ttctattctg 3720
gggggtgggg tggggcagga cagcaagggg gaggattggg aagacaatag caggcatgct 3780
ggggatgcgg tgggctctat gggtacccag gtgctgaaga attgacccgg ttcctcctgg 3840
gccagaaaga agcaggcaca tccccttctc tgtgacacac cctgtccacg cccctggttc 3900
ttagttccag ccccactcat aggacactca tagctcagga gggctccgcc ttcaatccca 3960
cccgctaaag tacttggagc ggtctctccc tccctcatca gcccaccaaa ccaaacctag 4020
cctccaagag tgggaagaaa ttaaagcaag ataggctatt aagtgcagag ggagagaaaa 4080
tgcctccaac atgtgaggaa gtaatgagag aaatcataga attttaaggc catcatggcc 4140
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4200
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4260
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4320
ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac gctcaagtca 4380
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4440
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4500
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4560
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4620
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4680
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4740
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4800
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4860
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4920
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 4980
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5040
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5100
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5160
gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5220
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5280
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5340
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5400

tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5460
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5520
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5580
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5640
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5700
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5760
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5820
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5880
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 5940
tctaatacct ggaatgctgt tttccgggg atcgcagtgg tgagtaacca tgcatcatca 6000
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6060
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6120
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6180
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6240
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6300
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6360
ttttgagaca caacgtggct tcccccccc ccccattatt gaagcattta tcagggttat 6420
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6480
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6540
acctataaaa ataggcgtat cacgaggccc tttcgtc 6577

<210> 52
<211> 6718
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 52
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380

cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg gctagcttct actgcaacag cacccagctg 2940
ttcaacagca cctggttcaa cagcacctgg agcaccgagg gcagcaacaa caccgagggc 3000
agcgacacca tcaccctgcc ctgccgcatc aagcagatca tcaacatgtg gcagaaggtg 3060
ggcaaggcca tgtacgcccc ccccatcagc ggccagatcc gctgcagcag caacatcacc 3120
ggcctgctgc tgacccgcga cggcggcaac agcaacaacg agagcgagat cttccgtccg 3180
ggcggcggcg acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtgaag 3240
atcgagcccc tgggcgtggc ccccaccaag gccaagctta ccgtccaggc ccgccagctg 3300
ctgagcggca tcgtgcagca gcagaacaac ctgctgcgcg ccatcgaggc ccagcagcac 3360
ctgctgcagc tgaccgtgtg gggcatcaag cagctgcagg cccgcaccct ggccgtggag 3420
cgctacctga aggaccagca gcagctcgag cagatctgga accacaccac ctggatggag 3480
tgggaccgcg agatcaacaa ctacaccagc ctgatccaca gcctgatcga ggagagccag 3540
aaccagcacg agaagaacga gcaggagctg ctggagctgg acaagtgggc cagcctgtgg 3600
aactggttca acatcaccaa ctggctgtgg tacatcaagc tgttcatcat gatcgtgggc 3660
ggcctggtgg gcctgcgcat cgtgttcgcc gtgctgagca tctgaggatc cagatctgct 3720
gtgccttcta gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg 3780
gaaggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg 3840
agtaggtgtc attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg 3900
gaagacaata gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag 3960
aattgacccg gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca 4020
ccctgtccac gcccctggtt cttagttcca gccccactca taggacactc atagctcagg 4080
agggctccgc cttcaatccc acccgctaaa gtacttggag cggtctctcc ctccctcatc 4140
agcccaccaa accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat 4200
taagtgcaga gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag 4260
aattttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4320
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4380
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4440
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca 4500
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4560
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4620
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4680

tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4740
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4800
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4860
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4920
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4980
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5040
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5100
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5160
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5220
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5280
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5340
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5400
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5460
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5520
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5580
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5640
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5700
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5760
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5820
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5880
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5940
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6000
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6060
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccgggg gatcgcagtg 6120
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6180
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6240
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6300
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6360
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6420
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6480
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6540
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6600
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6660
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6718

<210> 53
<211> 6742
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 53
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540

tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg agccgcgcca agtggaacga caccctgaac 2940
aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga ccatcgtgtt caagcacagc 3000
agcggcggcg accccgagat cgtgacccac agcttcaact gcggcggcga gttcttctac 3060
tgcaacagca cccagctgtt caacagcacc tggttcaaca gcacctggag caccgagggc 3120
agcaacaaca ccgagggcag cgacaccatc accctgccct gccgcatcgc tagcagcaac 3180
aacgagagcg agatcttccg tccgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3240
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3300
cttaccgtcc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3360
cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3420
caggcccgca ccctggccgt ggagcgctac ctgaaggacc agcagcagct cgagcagatc 3480
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3540
cacagcctga tcgaggagag ccagaaccag cacgagaaga acgagcagga gctgctggag 3600
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3660
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 3720
agcatctgag gatccagatc tgctgtgcct tctagttgcc agccatctgt tgtttgcccc 3780
tccccctgtgc cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat 3840

gaggaaattg catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg 3900
caggacagca agggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc 3960
tctatgggta cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag 4020
gcacatcccc ttctctgtga cacaccctgt ccacgccect ggttcttagt tccagcccca 4080
ctcataggac actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt 4140
ggagcggtct ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga 4200
agaaattaaa gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg 4260
aggaagtaat gagagaaatc atagaatttt aaggccatca tggccttaat cttccgcttc 4320
ctcgctcact gactcgctgc gctcggtcgt tcggctgcgg cgagcggtat cagctcactc 4380
aaaggcggta atacggttat ccacagaatc aggggataac gcaggaaaga acatgtgagc 4440
aaaaggccag caaaaggcca ggaaccgtaa aaaggccgcg ttgctggcgt ttttccatag 4500
gctccgcccc cctgacgagc atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc 4560
gacaggacta taaagatacc aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt 4620
tccgaccctg ccgcttaccg gatacctgtc cgcctttctc ccttcgggaa gcgtggcgct 4680
ttctcatagc tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg 4740
ctgtgtgcac gaacccccg ttcagcccga ccgctgcgcc ttatccggta actatcgtct 4800
tgagtccaac ccggtaagac acgacttatc gccactggca gcagccactg gtaacaggat 4860
tagcagagcg aggtatgtag gcggtgctac agagttcttg aagtggtggc ctaactacgg 4920
ctacactaga agaacagtat ttggtatctg cgctctgctg aagccagtta ccttcggaaa 4980
aagagttggt agctcttgat ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt 5040
ttgcaagcag cagattacgc gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc 5100
tacggggtct gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt 5160
atcaaaaagg atcttcacct agatcctttt aaattaaaaa tgaagtttta aatcaatcta 5220
aagtatatat gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg aggcacctat 5280
ctcagcgatc tgtctatttc gttcatccat agttgcctga ctcgggggggg gggggcgctg 5340
aggtctgcct cgtgaagaag gtgttgctga ctcataccag gcctgaatcg ccccatcatc 5400
cagccagaaa gtgagggagc cacggttgat gagagctttg ttgtaggtgg accagttggt 5460
gattttgaac ttttgctttg ccacggaacg gtctgcgttg tcgggaagat gcgtgatctg 5520
atccttcaac tcagcaaaag ttcgatttat tcaacaaagc cgccgtcccg tcaagtcagc 5580
gtaatgctct gccagtgtta caaccaatta accaattctg attagaaaaa ctcatcgagc 5640
atcaaatgaa actgcaattt attcatatca ggattatcaa taccatattt ttgaaaaagc 5700
cgtttctgta atgaaggaga aaactcaccg aggcagttcc ataggatggc aagatcctgg 5760
tatcggtctg cgattccgac tcgtccaaca tcaatacaac ctattaattt cccctcgtca 5820
aaaataaggt tatcaagtga gaaatcacca tgagtgacga ctgaatccgg tgagaatggc 5880
aaaagcttat gcatttcttt ccagacttgt tcaacaggcc agccattacg ctcgtcatca 5940
aaatcactcg catcaaccaa accgttattc attcgtgatt gcgcctgagc gagacgaaat 6000
acgcgatcgc tgttaaaagg acaattacaa acaggaatcg aatgcaaccg gcgcaggaac 6060
actgccagcg catcaacaat attttcacct gaatcaggat attcttctaa tacctggaat 6120
gctgttttcc cggggatcgc agtggtgagt aaccatgcat catcaggagt acggataaaa 6180
tgcttgatgg tcggaagagg cataaattcc gtcagccagt ttagtctgac catctcatct 6240
gtaacatcat tggcaacgct acctttgcca tgtttcagaa acaactctgg cgcatcgggc 6300
ttcccataca atcgatagat tgtcgcacct gattgcccga cattatcgcg agcccattta 6360
tacccatata aatcagcatc catgttggaa tttaatcgcg gcctcgagca agacgtttcc 6420
cgttgaatat ggctcataac acccttgta ttactgttta tgtaagcaga cagttttatt 6480
gttcatgatg atatattttt atcttgtgca atgtaacatc agagattttg agacacaacg 6540
tggctttccc ccccccccca ttattgaagc atttatcagg gttattgtct catgagcgga 6600
tacatatttg aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga 6660
aaagtgccac ctgacgtcta agaaaccatt attatcatga cattaaccta taaaaatagg 6720
cgtatcacga ggccctttcg tc 6742

<210> 54
<211> 6781
<212> DNA

<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 54
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca agggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta acttcgccga caacgccaag 2760
gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaaga gcatccacat cggccccggc cgcgccttct acaccaccgg cgagatcatc 2880
ggcgacatcc gccaggccca ctgcaacctg agccgcgcca agtggaacga caccctgaac 2940

aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga ccatcgtgtt caagcacagc 3000
agcggcggcg accccgagat cgtgacccac agcttcaact gcggcggcga gttcttctac 3060
tgcaacagca cccagctgtt caacagcacc tggttcaaca gcacctggag caccgagggc 3120
agcaacaaca ccgagggcag cgacaccatc accctgccct gccgcatcaa gcagatcatc 3180
aacatgtggc agaaggtggg caaggccatg tacgcccccc ccatcagcgg ccagatccgc 3240
tgcagcagca acatcaccgg cctgctgctg acccgcgacg gcggcaacag caacaacgag 3300
agcgagatct tccgtccggg cggcggcgct agcgccaagc ttaccgtcca ggcccgccag 3360
ctgctgagcg gcatcgtgca gcagcagaac aacctgctgc gcgccatcga ggcccagcag 3420
cacctgctgc agctgaccgt gtggggcatc aagcagctgc aggcccgcac cctggccgtg 3480
gagcgctacc tgaaggacca gcagcagctc gagcagatct ggaaccacac cacctggatg 3540
gagtgggacc gcgagatcaa caactacacc agcctgatcc acagcctgat cgaggagagc 3600
cagaaccagc acgagaagaa cgagcaggag ctgctggagc tggacaagtg ggccagcctg 3660
tggaactggt tcaacatcac caactggctg tggtacatca agctgttcat catgatcgtg 3720
ggcggcctgg tgggcctgcg catcgtgttc gccgtgctga gcatctgagg atccagatct 3780
gctgtgcctt ctagttgcca gccatctgtt gtttgccccc cccccgtgcc ttccttgacc 3840
ctggaaggtg ccactcccac tgtcctttcc taataaaatg aggaaattgc atcgcattgt 3900
ctgagtaggt gtcattctat tctgggggggt ggggtggggc aggacagcaa gggggaggat 3960
tgggaagaca atagcaggca tgctggggat gcggtgggct ctatgggtac ccaggtgctg 4020
aagaattgac ccggttcctc ctgggccaga aagaagcagg cacatccccc tctctgtgac 4080
acaccctgtc cacgcccctg gttcttagtt ccagccccac tcataggaca ctcatagctc 4140
aggagggctc cgccttcaat cccacccgct aaagtacttg gagcggtctc tccctccctc 4200
atcagcccac caaaccaaac ctagcctcca agagtgggaa gaaattaaag caagataggc 4260
tattaagtgc agagggagag aaaatgcctc caacatgtga ggaagtaatg agagaaatca 4320
tagaatttta aggccatcat ggccttaatc ttccgcttcc tcgctcactg actcgctgcg 4380
ctcggtcgtt cggctgcggc gagcggtatc agctcactca aaggcggtaa tacggttatc 4440
cacagaatca ggggataacg caggaaagaa catgtgagca aaaggccagc aaaaggccag 4500
gaaccgtaaa aaggccgcgt tgctggcgtt tttccatagg ctccgccccc ctgacgagca 4560
tcacaaaaat cgacgctcaa gtcagaggtg gcgaaacccg acaggactat aaagatacca 4620
ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg 4680
atacctgtcc gcctttctcc cttcgggaag cgtggcgctt tctcatagct cacgctgtag 4740
gtatctcagt tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt 4800
tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc cggtaagaca 4860
cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga ggtatgtagg 4920
cggtgctaca gagttcttga agtggtggcc taactacggc tacactagaa gaacagtatt 4980
tggtatctgc gctctgctga agccagttac cttcggaaaa agagttggta gctcttgatc 5040
cggcaaacaa accaccgctg gtagcggtgg ttttttgtt tgcaagcagc agattacgcg 5100
cagaaaaaaa ggatctcaag aagatccttt gatcttttct acggggtctg acgctcagtg 5160
gaacgaaaac tcacgttaag ggattttggt catgagatta tcaaaaagga tcttcaccta 5220
gatcctttta aattaaaaat gaagttttaa atcaatctaa agtatatatg agtaaacttg 5280
gtctgacagt taccaatgct taatcagtga ggcacctatc tcagcgatct gtctatttcg 5340
ttcatccata gttgcctgac tcgggggggg ggggcgctga ggtctgcctc gtgaagaagg 5400
tgttgctgac tcataccagg cctgaatcgc cccatcatcc agccagaaag tgagggagcc 5460
acggttgatg agagctttgt tgtaggtgga ccagttggtg attttgaact tttgctttgc 5520
cacggaacgg tctgcgttgt cgggaagatg cgtgatctga tccttcaact cagcaaaagt 5580
tcgatttatt caacaaagcc gccgtcccgt caagtcagcg taatgctctg ccagtgttac 5640
aaccaattaa ccaattctga ttagaaaaac tcatcgagca tcaaatgaaa ctgcaattta 5700
ttcatatcag gattatcaat accatatttt tgaaaaagcc gtttctgtaa tgaaggagaa 5760
aactcaccga ggcagttcca taggatggca agatcctggt atcggtctgc gattccgact 5820
cgtccaacat caatacaacc tattaatttc ccctcgtcaa aaataaggtt atcaagtgag 5880
aaatcaccat gagtgacgac tgaatccggt gagaatggca aaagcttatg catttctttc 5940
cagacttgtt caacaggcca gccattacgc tcgtcatcaa aatcactcgc atcaaccaaa 6000
ccgttattca ttcgtgattg cgcctgagcg agacgaaata cgcgatcgct gttaaaagga 6060
caattacaaa caggaatcga atgcaaccgg cgcaggaaca ctgccagcgc atcaacaata 6120
ttttcacctg aatcaggata ttcttctaat acctggaatg ctgttttccc ggggatcgca 6180
gtggtgagta accatgcatc atcaggagta cggataaaat gcttgatggt cggaagaggc 6240

ataaattccg tcagccagtt tagtctgacc atctcatctg taacatcatt ggcaacgcta 6300
cctttgccat gtttcagaaa caactctggc gcatcgggct tcccatacaa tcgatagatt 6360
gtcgcacctg attgcccgac attatcgcga gcccatttat acccatataa atcagcatcc 6420
atgttggaat ttaatcgcgg cctcgagcaa gacgtttccc gttgaatatg gctcataaca 6480
ccccttgtat tactgtttat gtaagcagac agttttattg ttcatgatga tatattttta 6540
tcttgtgcaa tgtaacatca gagattttga gacacaacgt ggctttcccc ccccccccat 6600
tattgaagca tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag 6660
aaaaataaac aaataggggt tccgcgcaca tttccccgaa aagtgccacc tgacgtctaa 6720
gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag gccctttcgt 6780
c 6781

<210> 55
<211> 6808
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 55
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980

tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 2760
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 2820
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2880
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2940
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 3000
gcaacagcac ccagctgttc aacagcacct ggttcaacag cacctggagc accgagggca 3060
gcaacaacac cgagggcagc gacaccatca ccctgccctg ccgcatcaag cagatcatca 3120
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 3180
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 3240
gcgagatctt ccgtccgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 3300
agtacaaggt ggtgaagatc gagcccctgg gcgtggcccc caccaaggcc aagcttaccg 3360
tccaggcccg ccagctgctg agcggcatcg tgcagcagca gaacaacctg ctgcgcgcca 3420
tcgaggccca gcagcacctg ctgcagctga ccgtgtgggg catcaagcag ctgcaggccc 3480
gcaccctggc cgtggagcgc tacctgaagg accagcagca gctcgagcag atctggaacc 3540
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 3600
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 3660
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtac atcaagctgt 3720
tcatcatgat cgtgggcggc ctggtgggcc tgcgcatcgt gttcgccgtg ctgagcatct 3780
gaggatccag atctgctgtg ccttctagtt gccagccatc tgttgtttgc ccctcccccg 3840
tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa aatgaggaaa 3900
ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg gggtggggtg gggcaggaca 3960
gcaaggggga ggattgggaa gacaatagca ggcatgctgg ggatgcggtg ggctctatgg 4020
gtacccaggt gctgaagaat tgacccggtt cctcctgggc cagaaagaag caggcacatc 4080
cccttctctg tgacacaccc tgtccacgcc cctggttctt agttccagcc ccactcatag 4140
gacactcata gctcaggagg gctccgcctt caatcccacc cgctaaagta cttggagcgg 4200
tctctccctc cctcatcagc ccaccaaacc aaacctagcc tccaagagtg ggaagaaatt 4260
aaagcaagat aggctattaa gtgcagaggg agagaaaatg cctccaacat gtgaggaagt 4320
aatgagagaa atcatagaat tttaaggcca tgatttaagg ccatcatggc cttaatcttc 4380
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 4440
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat 4500
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 4560
ccataggctc cgccccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 4620
aaacccgaca ggactataaa gataccaggc gtttcccccct ggaagctccc tcgtgcgctc 4680
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 4740
ggcgctttct catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 4800
gctgggctgt gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta 4860
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 4920
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 4980
ctacggctac actagaagaa cagtatttgg tatctgcgct ctgctgaagc cagttacctt 5040
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 5100
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 5160
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 5220
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 5280

aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 5340
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcg gggggggggg 5400
gcgctgaggt ctgcctcgtg aagaaggtgt tgctgactca taccaggcct gaatcgcccc 5460
atcatccagc cagaaagtga gggagccacg gttgatgaga gctttgttgt aggtggacca 5520
gttggtgatt ttgaactttt gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt 5580
gatctgatcc ttcaactcag caaaagttcg atttattcaa caaagccgcc gtcccgtcaa 5640
gtcagcgtaa tgctctgcca gtgttacaac caattaacca attctgatta gaaaaactca 5700
tcgagcatca aatgaaactg caatttattc atatcaggat tatcaatacc atatttttga 5760
aaaagccgtt tctgtaatga aggagaaaac tcaccgaggc agttccatag gatggcaaga 5820
tcctggtatc ggtctgcgat tccgactcgt ccaacatcaa tacaacctat taatttcccc 5880
tcgtcaaaaa taaggttatc aagtgagaaa tcaccatgag tgacgactga atccggtgag 5940
aatggcaaaa gcttatgcat ttctttccag acttgttcaa caggccagcc attacgctcg 6000
tcatcaaaat cactcgcatc aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga 6060
cgaaatacgc gatcgctgtt aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc 6120
aggaacactg ccagcgcatc aacaatattt tcacctgaat caggatattc ttctaatacc 6180
tggaatgctg ttttcccggg gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg 6240
ataaaatgct tgatggtcgg aagaggcata aattccgtca gccagtttag tctgaccatc 6300
tcatctgtaa catcattggc aacgctacct ttgccatgtt tcagaaacaa ctctggcgca 6360
tcgggcttcc catacaatcg atagattgtc gcacctgatt gcccgacatt atcgcgagcc 6420
catttatacc catataaatc agcatccatg ttggaattta atcgcggcct cgagcaagac 6480
gtttcccgtt gaatatggct cataacaccc cttgtattac tgtttatgta agcagacagt 6540
tttattgttc atgatgatat atttttatct tgtgcaatgt aacatcagag attttgagac 6600
acaacgtggc tttccccccc cccccattat tgaagcattt atcagggtta ttgtctcatg 6660
agcggataca tatttgaatg tatttagaaa aataaacaaa taggggttcc gcgcacattt 6720
ccccgaaaag tgccacctga cgtctaagaa accattatta tcatgacatt aacctataaa 6780
aataggcgta tcacgaggcc ctttcgtc 6808

<210> 56
<211> 6769
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 56
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020

tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgccc caacaacaac acccgcaaga gcatccacat cggccccggc cgcgccttct 2760
acaccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacctg agccgcgcca 2820
agtggaacga caccctgaac aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga 2880
ccatcgtgtt caagcacagc agcggcggcg accccgagat cgtgacccac agcttcaact 2940
gcggcggcga gttcttctac tgcaacagca cccagctgtt caacagcacc tggttcaaca 3000
gcacctggag caccgagggc agcaacaaca ccgagggcag cgacaccatc accctgccct 3060
gccgcatcaa gcagatcatc aacatgtggc agaaggtggg caaggccatg tacgcccccc 3120
ccatcagcgg ccagatccgc tgcagcagca acatcaccgg cctgctgctg acccgcgacg 3180
gcggcaacag caacaacgag agcgagatct tccgtccggg cggcggcgac atgcgcgaca 3240
actggcgcag cgagctgtac aagtacaagg tggtgaagat cgagcccctg ggcgtggccc 3300
ccaccaaggc caagcttacc gtccaggccc gccagctgct gagcggcatc gtgcagcagc 3360
agaacaacct gctgcgcgcc atcgaggccc agcagcacct gctgcagctg accgtgtggg 3420
gcatcaagca gctgcaggcc cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc 3480
agctcgagca gatctggaac cacaccacct ggatggagtg ggaccgcgag atcaacaact 3540
acaccagcct gatccacagc ctgatcgagg agagccagaa ccagcaggag aagaacgagc 3600
aggagctgct ggagctggac aagtgggcca gcctgtggaa ctggttcaac atcaccaact 3660
ggctgtggta catcaagctg ttcatcatga tcgtgggcgg cctggtgggc ctgcgcatcg 3720
tgttcgccgt gctgagcatc tgaggatcca gatctgctgt gccttctagt tgccagccat 3780
ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact cccactgtcc 3840
tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat tctattctgg 3900
ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc aggcatgctg 3960
gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt tcctcctggg 4020
ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc ccctggttct 4080
tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct tcaatcccac 4140
ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac caaacctagc 4200
ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg gagagaaaat 4260
gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc atgatttaag 4320

gccatcatgg ccttaatctt ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg 4380
gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca cagaatcagg 4440
ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa 4500
ggccgcgttg ctggcgtttt tccataggct ccgcccccct gacgagcatc acaaaaatcg 4560
acgctcaagt cagaggtggc gaaacccgac aggactataa agataccagg cgtttccccc 4620
tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg cttaccggat acctgtccgc 4680
ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt atctcagttc 4740
ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa ccccccgttc agcccgaccg 4800
ctgcgcctta tccggtaact atcgtcttga gtccaacccg gtaagacacg acttatcgcc 4860
actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg gtgctacaga 4920
gttcttgaag tggtggccta actacggcta cactagaaga acagtatttg gtatctgcgc 4980
tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg gcaaacaaac 5040
caccgctggt agcggtggtt tttttgtttg caagcagcag attacgcgca gaaaaaaagg 5100
atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagtgga acgaaaactc 5160
acgttaaggg attttggtca tgagattatc aaaaaggatc ttcacctaga tccttttaaa 5220
ttaaaaatga agttttaaat caatctaaag tatatatgag taaacttggt ctgacagtta 5280
ccaatgctta atcagtgagg cacctatctc agcgatctgt ctatttcgtt catccatagt 5340
tgcctgactc ggggggggg ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc 5400
ataccaggcc tgaatcgccc catcatccag ccagaaagtg agggagccac ggttgatgag 5460
agctttgttg taggtggacc agttggtgat tttgaacttt tgctttgcca cggaacggtc 5520
tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca gcaaaagttc gatttattca 5580
acaaagccgc cgtcccgtca agtcagcgta atgctctgcc agtgttacaa ccaattaacc 5640
aattctgatt agaaaaactc atcgagcatc aaatgaaact gcaatttatt catatcagga 5700
ttatcaatac catatttttg aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg 5760
cagttccata ggatggcaag atcctggtat cggtctgcga ttccgactcg tccaacatca 5820
atacaaccta ttaatttccc ctcgtcaaaa ataaggttat caagtgagaa atcaccatga 5880
gtgacgactg aatccggtga gaatggcaaa agcttatgca tttctttcca gacttgttca 5940
acaggccagc cattacgctc gtcatcaaaa tcactcgcat caaccaaacc gttattcatt 6000
cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt taaaaggaca attacaaaca 6060
ggaatcgaat gcaaccggcg caggaacact gccagcgcat caacaatatt ttcacctgaa 6120
tcaggatatt cttctaatac ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac 6180
catgcatcat caggagtacg gataaaatgc ttgatggtcg gaagaggcat aaattccgtc 6240
agccagttta gtctgaccat ctcatctgta acatcattgg caacgctacc tttgccatgt 6300
ttcagaaaca actctggcgc atcgggcttc ccatacaatc gatagattgt cgcacctgat 6360
tgcccgacat tatcgcgagc ccatttatac ccatataaat cagcatccat gttggaattt 6420
aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc tcataacacc ccttgtatta 6480
ctgtttatgt aagcagacag ttttattgtt catgatgata tatttttatc ttgtgcaatg 6540
taacatcaga gattttgaga cacaacgtgg ctttcccccc ccccccatta ttgaagcatt 6600
tatcagggtt attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa 6660
ataggggttc cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt 6720
atcatgacat taacctataa aaataggcgt atcacgaggc cctttcgtc 6769

<210> 57
<211> 6784
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 57
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120

ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcaac atcagcacca 2400
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 2460
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 2520
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 2580
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 2640
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2700
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2760
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgcgctagc gcccactgca 2820
acctgagccg cgccaagtgg aacgacaccc tgaacaagat cgtgatcaag ctgcgcgagc 2880
agttcggcaa caagaccatc gtgttcaagc acagcagcgg cggcgacccc gagatcgtga 2940
cccacagctt caactgcggc ggcgagttct tctactgcaa cagcacccag ctgttcaaca 3000
gcacctggtt caacagcacc tggagcaccg agggcagcaa caacaccgag ggcagcgaca 3060
ccatcaccct gccctgccgc atcaagcaga tcatcaacat gtggcagaag gtgggcaagg 3120
ccatgtacgc ccccccatc agcggccaga tccgctgcag cagcaacatc accggcctgc 3180
tgctgacccg cgacggcggc aacagcaaca acgagagcga gatcttccgt ccgggcggcg 3240
gcgacatgcg cgacaactgg cgcagcgagc tgtacaagta caaggtggtg aagatcgagc 3300
ccctgggcgt ggcccccacc aaggccaagc ttaccgtcca ggcccgccag ctgctgagcg 3360
gcatcgtgca gcagcagaac aacctgctgc gcgccatcga ggcccagcag cacctgctgc 3420

agctgaccgt gtggggcatc aagcagctgc aggcccgcac cctggccgtg gagcgctacc 3480
tgaaggacca gcagcagctc gagcagatct ggaaccacac cacctggatg gagtgggacc 3540
gcgagatcaa caactacacc agcctgatcc acagcctgat cgaggagagc cagaaccagc 3600
aggagaagaa cgagcaggag ctgctggagc tggacaagtg ggccagcctg tggaactggt 3660
tcaacatcac caactggctg tggtacatca agctgttcat catgatcgtg ggcggcctgg 3720
tgggcctgcg catcgtgttc gccgtgctga gcatctgagg atccagatct gctgtgcctt 3780
ctagttgcca gccatctgtt gtttgccccc cccccgtgcc ttccttgacc ctggaaggtg 3840
ccactcccac tgtcctttcc taataaaatg aggaaattgc atcgcattgt ctgagtaggt 3900
gtcattctat tctgggggggt ggggtggggc aggacagcaa gggggaggat tgggaagaca 3960
atagcaggca tgctggggat gcggtgggct ctatgggtac ccaggtgctg aagaattgac 4020
ccggttcctc ctgggccaga aagaagcagg cacatcccct tctctgtgac acaccctgtc 4080
cacgcccctg gttcttagtt ccagccccac tcataggaca ctcatagctc aggagggctc 4140
cgccttcaat cccacccgct aaagtacttg gagcggtctc tccctccctc atcagcccac 4200
caaaccaaac ctagcctcca agagtgggaa gaaattaaag caagataggc tattaagtgc 4260
agagggagag aaaatgcctc caacatgtga ggaagtaatg agagaaatca tagaatttta 4320
aggccatgat ttaaggccat catggcctta atcttccgct tcctcgctca ctgactcgct 4380
gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg taatacggtt 4440
atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc 4500
caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc cccctgacga 4560
gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac tataaagata 4620
ccaggcgttt cccccctggaa gctccctcgt gcgctctcct gttccgaccc tgccgcttac 4680
cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata gctcacgctg 4740
taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc 4800
cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca acccggtaag 4860
acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag cgaggtatgt 4920
aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta gaagaacagt 4980
atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg gtagctcttg 5040
atccggcaaa caaaccaccg ctggtagcgg tggtttttttt gtttgcaagc agcagattac 5100
gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt ctgacgctca 5160
gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac 5220
ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat atgagtaaac 5280
ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga tctgtctatt 5340
tcgttcatcc atagttgcct gactcggggg ggggggcgc tgaggtctgc ctcgtgaaga 5400
aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga aagtgaggga 5460
gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga actttgcttt 5520
tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca actcagcaaa 5580
agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct ctgccagtgt 5640
tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg aaactgcaat 5700
ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg taatgaagga 5760
gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc tgcgattccg 5820
actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag gttatcaagt 5880
gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt atgcatttct 5940
ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact cgcatcaacc 6000
aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc gctgttaaaa 6060
ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag cgcatcaaca 6120
atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt cccggggatc 6180
gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat ggtcggaaga 6240
ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc attggcaacg 6300
ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata caatcgatag 6360
attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata taaatcagca 6420
tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat atggctcata 6480
acacccccttg tattactgtt tatgtaagca gacagtttta ttgttcatga tgatatattt 6540
ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc ccccccccc 6600
cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt 6660
tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc 6720

taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac gaggcccttt 6780
cgtc 6784

<210> 58
<211> 6787
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 58
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcaac atcagcacca 2400
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 2460

tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 2520
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 2580
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 2640
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2700
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2760
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgccccaac aacaacaccc 2820
gcaagagcat ccacatcggc cccggccgcg ccttctacac caccggcgag atcatcggcg 2880
acatccgcca ggcccactgc aacctgagcc gcgccaagtg gaacgacacc ctgaacaaga 2940
tcgtgatcaa gctgcgcgag cagttcggca acaagaccat cgtgttcaag cacagcagcg 3000
gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc ttctactgca 3060
acagcgctag cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 3120
aggccatgta cgccccccca atcagcggcc agatccgctg cagcagcaac atcaccggcc 3180
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 3240
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 3300
agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 3360
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 3420
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 3480
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 3540
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 3600
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 3660
ggttcaacat caccaactgg ctgtggtaca tcaagctgtt catcatgatc gtgggcggcc 3720
tggtgggcct gcgcatcgtg ttcgccgtgc tgagcatctg aggatccaga tctgctgtgc 3780
cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg accctggaag 3840
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat tgtctgagta 3900
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caaggggag gattgggaag 3960
acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg ctgaagaatt 4020
gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt gacacaccct 4080
gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag ctcaggaggg 4140
ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc ctcatcagcc 4200
caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata ggctattaag 4260
tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa tcatagaatt 4320
ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4380
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4440
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4500
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 4560
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4620
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4680
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4740
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4800
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4860
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4920
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4980
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 5040
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 5100
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 5160
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 5220
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5280
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5340
atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc tgcctcgtga 5400
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5460
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5520
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5580
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5640
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5700
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5760

ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5820
ccgactcgtc caacatcaat acaacctatt aatttcccct cgtcaaaaat aaggttatca 5880
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5940
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 6000
accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 6060
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 6120
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttcccgggg 6180
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6240
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6300
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6360
tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6420
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6480
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6540
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6600
ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6660
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6720
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6780
tttcgtc 6787

<210> 59
<211> 6691
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 59
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500

agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2640
acacccgcaa gagcatccac atcggccccg gccgcgcctt ctacaccacc ggcgagatca 2700
tcggcgacat ccgccaggcc cactgcaacc tgagccgcgc caagtggaac gacaccctga 2760
acaagatcgt gatcaagctg cgcgagcagt tcggcaacaa gaccatcgtg ttcaagcaca 2820
gcagcggcgg cgaccccgag atcgtgaccc acagcttcaa ctgcggcggc gagttcttct 2880
actgcaacag cacccagctg ttcaacagca cctggttcaa cagcacctgg agcaccgagg 2940
gcagcaacaa caccgagggc agcgacacca tcaccctgcc ctgccgcatc aagcagatca 3000
tcaacatgtg gcagaaggtg ggcaaggcca tgtacgcccc ccccatcagc ggccagatcc 3060
gctgcagcag caacatcacc ggcctgctgc tgacccgcga cggcggcaac agcaacaacg 3120
agagcgagat cttccgtccg ggcggcggcg acatgcgcga caactggcgc agcgagctgt 3180
acaagtacaa ggtggtgaag atcgagcccc tgggcgtggc ccccaccaag gccaagctta 3240
ccgtccaggc ccgccagctg ctgagcggca tcgtgcagca gcagaacaac ctgctgcgcg 3300
ccatcgaggc ccagcagcac ctgctgcagc tgaccgtgtg gggcatcaag cagctgcagg 3360
cccgcaccct ggccgtggag cgctacctga aggaccagca gcagctcgag cagatctgga 3420
accacaccac ctggatggag tgggaccgcg agatcaacaa ctacaccagc ctgatccaca 3480
gcctgatcga ggagagccag aaccagcagg agaagaacga gcaggagctg ctggagctgg 3540
acaagtgggc cagcctgtgg aactggttca acatcaccaa ctggctgtgg tacatcaagc 3600
tgttcatcat gatcgtgggc ggcctggtgg gcctgcgcat cgtgttcgcc gtgctgagca 3660
tctgaggatc cagatctgct gtgccttcta gttgccagcc atctgttgtt tgcccctccc 3720
ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa taaaatgagg 3780
aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg gtggggcagg 3840
acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg gtgggctcta 3900
tgggtaccca ggtgctgaag aattgacccg gttcctcctg ggccagaaag aagcaggcac 3960
atccccttct ctgtgacaca ccctgtccac gcccctggtt cttagttcca gccccactca 4020
taggacactc atagctcagg agggctccgc cttcaatccc acccgctaaa gtacttggag 4080
cggtctctcc ctccctcatc agcccaccaa accaaaccta gcctccaaga gtgggaagaa 4140
attaaagcaa gataggctat taagtgcaga gggagagaaa atgcctccaa catgtgagga 4200
agtaatgaga gaaatcatag aattttaagg ccatgattta aggccatcat ggccttaatc 4260
ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc gagcggtatc 4320
agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg caggaaagaa 4380
catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt 4440
tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa gtcagaggtg 4500
gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct ccctcgtgcg 4560
ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc cttcgggaag 4620
cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg tcgttcgctc 4680
caagctgggc tgtgtgcacg aaccccccgt tcagcccgac cgctgcgcct tatccggtaa 4740
ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag cagccactgg 4800

taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga agtggtggcc 4860
taactacggc tacactagaa gaacagtatt tggtatctgc gctctgctga agccagttac 4920
cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg gtagcggtgg 4980
ttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag aagatccttt 5040
gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag ggattttggt 5100
catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat gaagttttaa 5160
atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct taatcagtga 5220
ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac tcgggggggg 5280
ggggcgctga ggtctgcctc gtgaagaagg tgttgctgac tcataccagg cctgaatcgc 5340
cccatcatcc agccagaaag tgagggagcc acggttgatg agagctttgt tgtaggtgga 5400
ccagttggtg attttgaact tttgctttgc cacggaacgg tctgcgttgt cgggaagatg 5460
cgtgatctga tccttcaact cagcaaaagt tcgatttatt caacaaagcc gccgtcccgt 5520
caagtcagcg taatgctctg ccagtgttac aaccaattaa ccaattctga ttagaaaaac 5580
tcatcgagca tcaaatgaaa ctgcaattta ttcatatcag gattatcaat accatatttt 5640
tgaaaaagcc gtttctgtaa tgaaggagaa aactcaccga ggcagttcca taggatggca 5700
agatcctggt atcggtctgc gattccgact cgtccaacat caatacaacc tattaatttc 5760
ccctcgtcaa aaataaggtt atcaagtgag aaatcaccat gagtgacgac tgaatccggt 5820
gagaatggca aaagcttatg catttctttc cagacttgtt caacaggcca gccattacgc 5880
tcgtcatcaa aatcactcgc atcaaccaaa ccgttattca ttcgtgattg cgcctgagcg 5940
agacgaaata cgcgatcgct gttaaaagga caattacaaa caggaatcga atgcaaccgg 6000
cgcaggaaca ctgccagcgc atcaacaata ttttcacctg aatcaggata ttcttctaat 6060
acctggaatg ctgttttccc ggggatcgca gtggtgagta accatgcatc atcaggagta 6120
cggataaaat gcttgatggt cggaagaggc ataaattccg tcagccagtt tagtctgacc 6180
atctcatctg taacatcatt ggcaacgcta cctttgccat gtttcagaaa caactctggc 6240
gcatcgggct tcccatacaa tcgatagatt gtcgcacctg attgcccgac attatcgcga 6300
gcccatttat acccatataa atcagcatcc atgttggaat ttaatcgcgg cctcgagcaa 6360
gacgtttccc gttgaatatg gctcataaca ccccttgtat tactgtttat gtaagcagac 6420
agttttattg ttcatgatga tatattttta tcttgtgcaa tgtaacatca gagattttga 6480
gacacaacgt ggctttcccc ccccccccat tattgaagca tttatcaggg ttattgtctc 6540
atgagcggat acatatttga atgtatttag aaaaataaac aaatagggggt tccgcgcaca 6600
tttccccgaa aagtgccacc tgacgtctaa gaaaccatta ttatcatgac attaacctat 6660
aaaaataggc gtatcacgag gccctttcgt c 6691

<210> 60
<211> 6727
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 60
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660

ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcgct agcgcccact 2760
gcaacctgag ccgcgccaag tggaacgaca ccctgaacaa gatcgtgatc aagctgcgcg 2820
agcagttcgg caacaagacc atcgtgttca agcacagcag cggcggcgac cccgagatcg 2880
tgacccacag cttcaactgc ggcggcgagt tcttctactg caacagcacc cagctgttca 2940
acagcacctg gttcaacagc acctggagca ccgagggcag caacaacacc gagggcagcg 3000
acaccatcac cctgccctgc cgcatcaagc agatcatcaa catgtggcag aaggtgggca 3060
aggccatgta cgccccccca atcagcggcc agatccgctg cagcagcaac atcaccggcc 3120
tgctgctgac ccgcgacggc ggcaacagca acaacgagag cgagatcttc cgtccgggcg 3180
gcggcgacat gcgcgacaac tggcgcagcg agctgtacaa gtacaaggtg gtgaagatcg 3240
agcccctggg cgtggccccc accaaggcca agcttaccgt ccaggcccgc cagctgctga 3300
gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag cagcacctgc 3360
tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg caccctggcc gtggagcgct 3420
acctgaagga ccagcagcag ctcgagcaga tctggaacca caccacctgg atggagtggg 3480
accgcgagat caacaactac accagcctga tccacagcct gatcgaggag agccagaacc 3540
agcaggagaa gaacgagcag gagctgctgg agctggacaa gtgggccagc ctgtggaact 3600
ggttcaacat caccaactgg ctgtggtaca tcaagctgtt catcatgatc gtgggcggcc 3660
tggtgggcct gcgcatcgtg ttcgccgtgc tgagcatctg aggatccaga tctgctgtgc 3720
cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg accctggaag 3780
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat tgtctgagta 3840
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag gattgggaag 3900
acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg ctgaagaatt 3960

gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt gacacaccct 4020
gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag ctcaggaggg 4080
ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc ctcatcagcc 4140
caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata ggctattaag 4200
tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa tcatagaatt 4260
ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4320
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4380
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4440
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 4500
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4560
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4620
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4680
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4740
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4800
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4860
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4920
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 4980
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 5040
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 5100
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 5160
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5220
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5280
atttcgttca tccatagttg cctgactccg gggggggggg cgctgaggtc tgcctcgtga 5340
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5400
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5460
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5520
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5580
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5640
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5700
ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5760
ccgactcgtc caacatcaat acaacctatt aatttccgct cgtcaaaaat aaggttatca 5820
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5880
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 5940
accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 6000
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 6060
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttccgcggg 6120
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6180
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6240
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6300
tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6360
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6420
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6480
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6540
ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6600
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6660
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6720
tttcgtc 6727

<210> 61
<211> 6730
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 61
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 2760
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 2820
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2880
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2940
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 3000
gcaacagcgc tagcctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 3060

gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 3120
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 3180
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 3240
tcgagcccct gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 3300
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 3360
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 3420
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 3480
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 3540
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 3600
actggttcaa catcaccaac tggctgtggt acatcaagct gttcatcatg atcgtgggcg 3660
gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat ctgaggatcc agatctgctg 3720
tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg 3780
aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga 3840
gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg 3900
aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga 3960
attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac 4020
cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca tagctcagga 4080
gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca 4140
gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt 4200
aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga 4260
attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4320
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4380
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4440
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4500
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4560
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4620
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4680
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4740
acccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4800
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4860
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4920
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 4980
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 5040
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 5100
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5160
cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa gtatatatga 5220
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5280
tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag gtctgcctcg 5340
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5400
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5460
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5520
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5580
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5640
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5700
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5760
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5820
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5880
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 5940
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 6000
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 6060
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6120
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6180
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6240
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6300
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6360

tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6420
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6480
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6540
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6600
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6660
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6720
ccctttcgtc 6730

<210> 62
<211> 6688
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 62
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160

tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgcgc tagcgcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2760
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2820
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 2880
gcaacagcac ccagctgttc aacagcacct ggttcaacag cacctggagc accgagggca 2940
gcaacaacac cgagggcagc gacaccatca ccctgccctg ccgcatcaag cagatcatca 3000
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 3060
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 3120
gcgagatctt ccgtccgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 3180
agtacaaggt ggtgaagatc gagccctgg gcgtggcccc caccaaggcc aagcttaccg 3240
tccaggcccg ccagctgctg agcggcatcg tgcagcagca gaacaacctg ctgcgcgcca 3300
tcgaggccca gcagcacctg ctgcagctga ccgtgtgggg catcaagcag ctgcaggccc 3360
gcaccctggc cgtggagcgc tacctgaagg accagcagca gctcgagcag atctggaacc 3420
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 3480
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 3540
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtac atcaagctgt 3600
tcatcatgat cgtgggcggc ctggtgggcc tgcgcatcgt gttcgccgtg ctgagcatct 3660
gaggatccag atctgctgtg ccttctagtt gccagccatc tgttgtttgc ccctcccccg 3720
tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa aatgaggaaa 3780
ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg gggtggggtg gggcaggaca 3840
gcaaggggga ggattgggaa gacaatagca ggcatgctgg ggatgcggtg ggctctatgg 3900
gtacccaggt gctgaagaat tgacccggtt cctcctgggc cagaaagaag caggcacatc 3960
cccttctctg tgacacaccc tgtccacgcc cctggttctt agttccagcc ccactcatag 4020
gacactcata gctcaggagg gctccgcctt caatcccacc cgctaaagta cttggagcgg 4080
tctctccctc cctcatcagc ccaccaaacc aaacctagcc tccaagagtg ggaagaaatt 4140
aaagcaagat aggctattaa gtgcagaggg agagaaaatg cctccaacat gtgaggaagt 4200
aatgagagaa atcatagaat tttaaggcca tgatttaagg ccatcatggc cttaatcttc 4260
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 4320
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat 4380
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 4440
ccataggctc cgccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 4500
aaacccgaca ggactataaa gataccaggc gtttcccccc ggaagctccc tcgtgcgctc 4560
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 4620
ggcgctttct catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 4680
gctgggctgt gtgcacgaac ccccgttca gcccgaccgc tgcgccttat ccggtaacta 4740
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 4800
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 4860
ctacggctac actagaagaa cagtatttgg tatctgcgct ctgctgaagc cagttacctt 4920
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 4980
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 5040
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 5100
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 5160
aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 5220
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcg gggggggggg 5280
gcgctgaggt ctgcctcgtg aagaaggtgt tgctgactca taccaggcct gaatcgcccc 5340
atcatccagc cagaaagtga gggagccacg gttgatgaga gctttgttgt aggtggacca 5400
gttggtgatt ttgaactttt gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt 5460

gatctgatcc ttcaactcag caaaagttcg atttattcaa caaagccgcc gtcccgtcaa 5520
gtcagcgtaa tgctctgcca gtgttacaac caattaacca attctgatta gaaaaactca 5580
tcgagcatca aatgaaactg caatttattc atatcaggat tatcaatacc atatttttga 5640
aaaagccgtt tctgtaatga aggagaaaac tcaccgaggc agttccatag gatggcaaga 5700
tcctggtatc ggtctgcgat tccgactcgt ccaacatcaa tacaacctat taatttcccc 5760
tcgtcaaaaa taaggttatc aagtgagaaa tcaccatgag tgacgactga atccggtgag 5820
aatggcaaaa gcttatgcat ttctttccag acttgttcaa caggccagcc attacgctcg 5880
tcatcaaaat cactcgcatc aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga 5940
cgaaatacgc gatcgctgtt aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc 6000
aggaacactg ccagcgcatc aacaatattt tcacctgaat caggatattc ttctaatacc 6060
tggaatgctg ttttccgggg gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg 6120
ataaaatgct tgatggtcgg aagaggcata aattccgtca gccagtttag tctgaccatc 6180
tcatctgtaa catcattggc aacgctacct ttgccatgtt tcagaaacaa ctctggcgca 6240
tcgggcttcc catacaatcg atagattgtc gcacctgatt gcccgacatt atcgcgagcc 6300
catttatacc catataaatc agcatccatg ttggaattta atcgcggcct cgagcaagac 6360
gtttcccgtt gaatatggct cataacaccc cttgtattac tgtttatgta agcagacagt 6420
tttattgttc atgatgatat atttttatct tgtgcaatgt aacatcagag attttgagac 6480
acaacgtggc tttccccccc cccccattat tgaagcattt atcagggtta ttgtctcatg 6540
agcggataca tatttgaatg tatttagaaa aataaacaaa taggggttcc gcgcacattt 6600
ccccgaaaag tgccacctga cgtctaagaa accattatta tcatgacatt aacctataaa 6660
aataggcgta tcacgaggcc ctttcgtc 6688

<210> 63
<211> 6691
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 63
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320

ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtctttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgccc caacaacaac acccgcaaga gcatccacat cggccccggc cgcgccttct 2760
acaccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacctg agccgcgcca 2820
agtggaacga caccctgaac aagatcgtga tcaagctgcg cgagcagttc ggcaacaaga 2880
ccatcgtgtt caagcacagc agcggcggcg accccgagat cgtgacccac agcttcaact 2940
gcggcggcga gttcttctac tgcaacagcg ctagcctgcc ctgccgcatc aagcagatca 3000
tcaacatgtg gcagaaggtg ggcaaggcca tgtacgcccc ccccatcagc ggccagatcc 3060
gctgcagcag caacatcacc ggcctgctgc tgacccgcga cggcggcaac agcaacaacg 3120
agagcgagat cttccgtccg ggcggcggcg acatgcgcga caactggcgc agcgagctgt 3180
acaagtacaa ggtggtgaag atcgagcccc tgggcgtggc ccccaccaag gccaagctta 3240
ccgtccaggc ccgccagctg ctgagcggca tcgtgcagca gcagaacaac ctgctgcgcg 3300
ccatcgaggc ccagcagcac ctgctgcagc tgaccgtgtg gggcatcaag cagctgcagg 3360
cccgcaccct ggccgtggag cgctacctga aggaccagca gcagctcgag cagatctgga 3420
accacaccac ctggatggag tgggaccgcg agatcaacaa ctacaccagc ctgatccaca 3480
gcctgatcga ggagagccag aaccagcagg agaagaacga gcaggagctg ctggagctgg 3540
acaagtgggc cagcctgtgg aactggttca acatcaccaa ctggctgtgg tacatcaagc 3600
tgttcatcat gatcgtgggc ggcctggtgg gcctgcgcat cgtgttcgcc gtgctgagca 3660
tctgaggatc cagatctgct gtgccttcta gttgccagcc atctgttgtt tgcccctccc 3720
ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa taaaatgagg 3780
aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg gtggggcagg 3840
acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg gtgggctcta 3900
tgggtaccca ggtgctgaag aattgacccg gttcctcctg ggccagaaag aagcaggcac 3960
atccccttct ctgtgacaca ccctgtccac gcccctggtt cttagttcca gccccactca 4020
taggacactc atagctcagg agggctccgc cttcaatccc acccgctaaa gtacttggag 4080
cggtctctcc ctccctcatc agcccaccaa accaaaccta gcctccaaga gtgggaagaa 4140
attaaagcaa gataggctat taagtgcaga gggagagaaa atgcctccaa catgtgagga 4200
agtaatgaga gaaatcatag aattttaagg ccatgattta aggccatcat ggccttaatc 4260
ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc gagcggtatc 4320
agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg caggaaagaa 4380
catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt 4440
tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa gtcagaggtg 4500
gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct ccctcgtgcg 4560
ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc cttcgggaag 4620

cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg tcgttcgctc 4680
caagctgggc tgtgtgcacg aacccccccgt tcagcccgac cgctgcgcct tatccggtaa 4740
ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag cagccactgg 4800
taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga agtggtggcc 4860
taactacggc tacactagaa gaacagtatt tggtatctgc gctctgctga agccagttac 4920
cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg gtagcggtgg 4980
ttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag aagatccttt 5040
gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag ggattttggt 5100
catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat gaagttttaa 5160
atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct taatcagtga 5220
ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac tcgggggggg 5280
ggggcgctga ggtctgcctc gtgaagaagg tgttgctgac tcataccagg cctgaatcgc 5340
cccatcatcc agccagaaag tgagggagcc acggttgatg agagctttgt tgtaggtgga 5400
ccagttggtg attttgaact tttgctttgc cacggaacgg tctgcgttgt cgggaagatg 5460
cgtgatctga tccttcaact cagcaaaagt tcgatttatt caacaaagcc gccgtcccgt 5520
caagtcagcg taatgctctg ccagtgttac aaccaattaa ccaattctga ttagaaaaac 5580
tcatcgagca tcaaatgaaa ctgcaattta ttcatatcag gattatcaat accatatttt 5640
tgaaaaagcc gtttctgtaa tgaaggagaa aactcaccga ggcagttcca taggatggca 5700
agatcctggt atcggtctgc gattccgact cgtccaacat caatacaacc tattaatttc 5760
ccctcgtcaa aaataaggtt atcaagtgag aaatcaccat gagtgacgac tgaatccggt 5820
gagaatggca aaagcttatg catttctttc cagacttgtt caacaggcca gccattacgc 5880
tcgtcatcaa aatcactcgc atcaaccaaa ccgttattca ttcgtgattg cgcctgagcg 5940
agacgaaata cgcgatcgct gttaaaagga caattacaaa caggaatcga atgcaaccgg 6000
cgcaggaaca ctgccagcgc atcaacaata ttttcacctg aatcaggata ttcttctaat 6060
acctggaatg ctgttttccc ggggatcgca gtggtgagta accatgcatc atcaggagta 6120
cggataaaat gcttgatggt cggaagaggc ataaattccg tcagccagtt tagtctgacc 6180
atctcatctg taacatcatt ggcaacgcta cctttgccat gtttcagaaa caactctggc 6240
gcatcgggct tcccatacaa tcgatagatt gtcgcacctg attgcccgac attatcgcga 6300
gcccatttat acccatataa atcagcatcc atgttggaat ttaatcgcgg cctcgagcaa 6360
gacgtttccc gttgaatatg gctcataaca ccccttgtat tactgtttat gtaagcagac 6420
agttttattg ttcatgatga tatattttta tcttgtgcaa tgtaacatca gagattttga 6480
gacacaacgt ggctttcccc ccccccccat tattgaagca tttatcaggg ttattgtctc 6540
atgagcggat acatatttga atgtatttag aaaaataaac aaataggggt tccgcgcaca 6600
tttccccgaa aagtgccacc tgacgtctaa gaaaccatta ttatcatgac attaacctat 6660
aaaaataggc gtatcacgag gccctttcgt c 6691

<210> 64
<211> 6706
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 64
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480

catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcaac atcagcacca 2400
gcatccgcgg caaggtgcag aaggagtacg ccttcttcta caagctggac atcatcccca 2460
tcgacaacga caccaccagc tacagcctga ccagctgcaa caccagcgtg atcacccagg 2520
cctgccccaa ggtgagcttc gagcccatcc ccaaccacta ctgcgccccc gccggcttcg 2580
ccatcctgaa gtgcaaggac aagaagttca acggcaaggg cccctgcacc aacgtgagca 2640
ccgtgcagtg cacccacggc atccgccccg tggtgagcac ccagctgctg ctgaacggta 2700
gcctggccga ggaggaggtg gtgatccgca gcgctaactt cgccgacaac gccaaggtga 2760
tcatcgtgca gctgaacgag agcgtggaga tcaactgcac ccgcgctagc gcccactgca 2820
acctgagccg cgccaagtgg aacgacaccc tgaacaagat cgtgatcaag ctgcgcgagc 2880
agttcggcaa caagaccatc gtgttcaagc acagcagcgg cggcgacccc gagatcgtga 2940
cccacagctt caactgcggc ggcgagttct tctactgcaa cagcgctagc ctgccctgcc 3000
gcatcaagca gatcatcaac atgtggcaga aggtgggcaa ggccatgtac gccccccca 3060
tcagcggcca gatccgctgc agcagcaaca tcaccggcct gctgctgacc cgcgacggcg 3120
gcaacagcaa caacgagagc gagatcttcc gtccgggcgg cggcgacatg cgcgacaact 3180
ggcgcagcga gctgtacaag tacaaggtgg tgaagatcga gccctgggc gtggcccca 3240
ccaaggccaa gcttaccgtc caggcccgcc agctgctgag cggcatcgtg cagcagcaga 3300
acaacctgct gcgcgccatc gaggcccagc agcacctgct gcagctgacc gtgtggggca 3360
tcaagcagct gcaggcccgc accctggccg tggagcgcta cctgaaggac cagcagcagc 3420
tcgagcagat ctggaaccac accacctgga tggagtggga ccgcgagatc aacaactaca 3480
ccagcctgat ccacagcctg atcgaggaga gccagaacca gcaggagaag aacgagcagg 3540
agctgctgga gctggacaag tgggccagcc tgtggaactg gttcaacatc accaactggc 3600
tgtggtacat caagctgttc atcatgatcg tgggcggcct ggtgggcctg cgcatcgtgt 3660
tcgccgtgct gagcatctga ggatccagat ctgctgtgcc ttctagttgc cagccatctg 3720
ttgtttgccc ctcccccgtg ccttccttga ccctggaagg tgccactccc actgtccttt 3780

cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct attctggggg 3840
gtggggtggg gcaggacagc aaggggagg attgggaaga caatagcagg catgctgggg 3900
atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc tcctgggcca 3960
gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc tggttcttag 4020
ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca atcccacccg 4080
ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa acctagcctc 4140
caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag agaaaatgcc 4200
tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg atttaaggcc 4260
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4320
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4380
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4440
cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca aaaatcgacg 4500
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 4560
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 4620
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 4680
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 4740
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 4800
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 4860
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 4920
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 4980
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 5040
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 5100
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5160
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5220
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5280
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5340
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5400
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5460
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 5520
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 5580
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 5640
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 5700
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 5760
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 5820
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 5880
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 5940
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 6000
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 6060
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6120
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6180
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6240
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6300
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6360
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6420
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6480
catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 6540
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 6600
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 6660
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6706

<210> 65
<211> 6649
<212> DNA

<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 65
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaagaa ctgcagcttc aacatcagca 2340
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 2400
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 2460
aggcctgccc caaggtgagc ttcgagccca tccccaacca ctactgcgcc cccgccggct 2520
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 2580
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 2640
gtagcctggc cgaggaggag gtggtgatcc gcagcgctaa cttcgccgac aacgccaagg 2700
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcgct agcgcccact 2760
gcaacctgag ccgcgccaag tggaacgaca ccctgaacaa gatcgtgatc aagctgcgcg 2820
agcagttcgg caacaagacc atcgtgttca agcacagcag cggcggcgac cccgagatcg 2880
tgacccacag cttcaactgc ggcggcgagt tcttctactg caacagcgct agcctgccct 2940

gccgcatcaa gcagatcatc aacatgtggc agaaggtggg caaggccatg tacgcccccc 3000
ccatcagcgg ccagatccgc tgcagcagca acatcaccgg cctgctgctg acccgcgacg 3060
gcggcaacag caacaacgag agcgagatct tccgtccggg cggcggcgac atgcgcgaca 3120
actggcgcag cgagctgtac aagtacaagg tggtgaagat cgagcccctg ggcgtggccc 3180
ccaccaaggc caagcttacc gtccaggccc gccagctgct gagcggcatc gtgcagcagc 3240
agaacaacct gctgcgcgcc atcgaggccc agcagcacct gctgcagctg accgtgtggg 3300
gcatcaagca gctgcaggcc cgcaccctgg ccgtggagcg ctacctgaag gaccagcagc 3360
agctcgagca gatctggaac cacaccacct ggatggagtg ggaccgcgag atcaacaact 3420
acaccagcct gatccacagc ctgatcgagg agagccagaa ccagcaggag aagaacgagc 3480
aggagctgct ggagctggac aagtgggcca gcctgtggaa ctggttcaac atcaccaact 3540
ggctgtggta catcaagctg ttcatcatga tcgtgggcgg cctggtgggc ctgcgcatcg 3600
tgttcgccgt gctgagcatc tgaggatcca gatctgctgt gccttctagt tgccagccat 3660
ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact cccactgtcc 3720
tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat tctattctgg 3780
ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc aggcatgctg 3840
gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt tcctcctggg 3900
ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc ccctggttct 3960
tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct tcaatcccac 4020
ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac caaacctagc 4080
ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg gagagaaaat 4140
gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc atgatttaag 4200
gccatcatgg ccttaatctt ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg 4260
gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca cagaatcagg 4320
ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa 4380
ggccgcgttg ctggcgtttt tccataggct ccgccccct gacgagcatc acaaaaatcg 4440
acgctcaagt cagaggtggc gaaacccgac aggactataa agataccagg cgtttccccc 4500
tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg cttaccggat acctgtccgc 4560
ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt atctcagttc 4620
ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa ccccccgttc agcccgaccg 4680
ctgcgcctta tccggtaact atcgtcttga gtccaacccg gtaagacacg acttatcgcc 4740
actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg gtgctacaga 4800
gttcttgaag tggtggccta actacggcta cactagaaga acagtatttg gtatctgcgc 4860
tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg gcaaacaaac 4920
caccgctggt agcggtggtt tttttgtttg caagcagcag attacgcgca gaaaaaaagg 4980
atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagtgga acgaaaactc 5040
acgttaaggg attttggtca tgagattatc aaaaaggatc ttcacctaga tccttttaaa 5100
ttaaaaatga agttttaaat caatctaaag tatatatgag taaacttggt ctgacagtta 5160
ccaatgctta atcagtgagg cacctatctc agcgatctgt ctatttcgtt catccatagt 5220
tgcctgactc ggggggggg ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc 5280
ataccaggcc tgaatcgccc catcatccag ccagaaagtg agggagccac ggttgatgag 5340
agctttgttg taggtggacc agttggtgat tttgaacttt tgctttgcca cggaacggtc 5400
tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca gcaaaagttc gatttattca 5460
acaaagccgc cgtcccgtca agtcagcgta atgctctgcc agtgttacaa ccaattaacc 5520
aattctgatt agaaaaactc atcgagcatc aaatgaaact gcaatttatt catatcagga 5580
ttatcaatac catatttttg aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg 5640
cagttccata ggatggcaag atcctggtat cggtctgcga ttccgactcg tccaacatca 5700
atacaaccta ttaatttccc ctcgtcaaaa ataaggttat caagtgagaa atcaccatga 5760
gtgacgactg aatccggtga gaatggcaaa agcttatgca tttctttcca gacttgttca 5820
acaggccagc cattacgctc gtcatcaaaa tcactcgcat caaccaaacc gttattcatt 5880
cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt taaaaggaca attacaaaca 5940
ggaatcgaat gcaaccggcg caggaacact gccagcgcat caacaatatt ttcacctgaa 6000
tcaggatatt cttctaatac ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac 6060
catgcatcat caggagtacg gataaaatgc ttgatggtcg gaagaggcat aaattccgtc 6120
agccagttta gtctgaccat ctcatctgta acatcattgg caacgctacc tttgccatgt 6180
ttcagaaaca actctggcgc atcgggcttc ccatacaatc gatagattgt cgcacctgat 6240

tgcccgacat tatcgcgagc ccatttatac ccatataaat cagcatccat gttggaattt 6300
aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc tcataacacc ccttgtatta 6360
ctgtttatgt aagcagacag ttttattgtt catgatgata tatttttatc ttgtgcaatg 6420
taacatcaga gattttgaga cacaacgtgg ctttcccccc ccccccatta ttgaagcatt 6480
tatcagggtt attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa 6540
atagggggttc cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt 6600
atcatgacat taacctataa aaataggcgt atcacgaggc cctttcgtc 6649

<210> 66
<211> 6610
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 66
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160

tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacc tgaagaacga caccaacacc aacagcagca 2340
gcggccgcat gatcatggag aagggcgaga tcaagaactg cagcttcgct agcaccagct 2400
gcaacaccag cgtgatcacc caggcctgcc ccaaggtgag cttcgagccc atccccaacc 2460
actactgcgc ccccgccggc ttcgccatcc tgaagtgcaa ggacaagaag ttcaacggca 2520
agggcccctg caccaacgtg agcaccgtgc agtgcaccca cggcatccgc cccgtggtga 2580
gcacccagct gctgctgaac ggtagcctgg ccgaggagga ggtggtgatc cgcagcgcta 2640
acttcgccga caacgccaag gtgatcatcg tgcagctgaa cgagagcgtg gagatcaact 2700
gcacccgcgc tagcgcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 2760
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 2820
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 2880
gcaacagcgc tagcctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 2940
gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 3000
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 3060
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 3120
tcgagccccc gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 3180
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 3240
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 3300
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 3360
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 3420
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 3480
actggttcaa catcaccaac tggctgtggt acatcaagct gttcatcatg atcgtgggcg 3540
gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat ctgaggatcc agatctgctg 3600
tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg 3660
aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga 3720
gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg 3780
aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga 3840
attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac 3900
cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca tagctcagga 3960
gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca 4020
gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt 4080
aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga 4140
attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4200
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4260
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4320
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4380
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4440
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4500
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4560
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4620
acccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4680
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4740
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4800
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 4860
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 4920
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 4980
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5040
cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa gtatatatga 5100
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5160
tctatttcgt tcatccatag ttgcctgact cgggggggg gggcgctgag gtctgcctcg 5220
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5280
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5340
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5400
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5460

cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5520
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5580
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5640
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5700
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5760
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 5820
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 5880
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 5940
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6000
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6060
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6120
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6180
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6240
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6300
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6360
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6420
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6480
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6540
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6600
ccctttcgtc 6610

<210> 67
<211> 6610
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 67
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380

cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc gctagcgccc 2640
actgcaacct gagccgcgcc aagtggaacg acaccctgaa caagatcgtg atcaagctgc 2700
gcgagcagtt cggcaacaag accatcgtgt tcaagcacag cagcggcggc gaccccgaga 2760
tcgtgaccca cagcttcaac tgcggcggcg agttcttcta ctgcaacagc acccagctgt 2820
tcaacagcac ctggttcaac agcacctgga gcaccgaggg cagcaacaac accgagggca 2880
gcgacaccat caccctgccc tgccgcatca agcagatcat caacatgtgg cagaaggtgg 2940
gcaaggccat gtacgccccc cccatcagcg gccagatccg ctgcagcagc aacatcaccg 3000
gcctgctgct gacccgcgac ggcggcaaca gcaacaacga gagcgagatc ttccgtccgg 3060
gcggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtgaaga 3120
tcgagccccc gggcgtggcc cccaccaagg ccaagcttac cgtccaggcc cgccagctgc 3180
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 3240
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcaccctg gccgtggagc 3300
gctacctgaa ggaccagcag cagctcgagc agatctggaa ccacaccacc tggatggagt 3360
gggaccgcga gatcaacaac tacaccagcc tgatccacag cctgatcgag gagagccaga 3420
accagcagga gaagaacgag caggagctgc tggagctgga caagtgggcc agcctgtgga 3480
actggttcaa catcaccaac tggctgtggt acatcaagct gttcatcatg atcgtgggcg 3540
gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat ctgaggatcc agatctgctg 3600
tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg 3660
aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga 3720
gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg 3780
aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga 3840
attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac 3900
cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca tagctcagga 3960
gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca 4020
gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt 4080
aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga 4140
attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4200
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4260
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4320
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4380
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4440
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4500
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4560
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4620
acccccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4680

ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4740
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4800
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 4860
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 4920
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 4980
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5040
cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa gtatatatga 5100
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5160
tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag gtctgcctcg 5220
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5280
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5340
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5400
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5460
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5520
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5580
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5640
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5700
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5760
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 5820
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 5880
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 5940
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6000
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6060
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6120
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6180
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6240
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6300
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6360
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6420
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6480
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6540
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6600
ccctttcgtc 6610

<210> 68
<211> 6613
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 68
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600

tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2640
acacccgcaa gagcatccac atcggccccg gccgcgcctt ctacaccacc ggcgagatca 2700
tcggcgacat ccgccaggcc cactgcaacc tgagccgcgc caagtggaac gacaccctga 2760
acaagatcgt gatcaagctg cgcgagcagt tcggcaacaa gaccatcgtg ttcaagcaca 2820
gcagcggcgg cgaccccgag atcgtgaccc acagcttcaa ctgcggcggc gagttcttct 2880
actgcaacag cgctagcctg ccctgccgca tcaagcagat catcaacatg tggcagaagg 2940
tgggcaaggc catgtacgcc ccccccatca gcggccagat ccgctgcagc agcaacatca 3000
ccggcctgct gctgacccgc gacggcggca acagcaacaa cgagagcgag atcttccgtc 3060
cgggcggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtga 3120
agatcgagcc cctgggcgtg gcccccacca aggccaagct taccgtccag gcccgccagc 3180
tgctgagcgg catcgtgcag cagcagaaca acctgctgcg cgccatcgag gcccagcagc 3240
acctgctgca gctgaccgtg tggggcatca agcagctgca ggcccgcacc ctggccgtgg 3300
agcgctacct gaaggaccag cagcagctcg agcagatctg gaaccacacc acctggatgg 3360
agtgggaccg cgagatcaac aactacacca gcctgatcca cagcctgatc gaggagagcc 3420
agaaccagca ggagaagaac gagcaggagc tgctggagct ggacaagtgg gccagcctgt 3480
ggaactggtt caacatcacc aactggctgt ggtacatcaa gctgttcatc atgatcgtgg 3540
gcggcctggt gggcctgcgc atcgtgttcg ccgtgctgag catctgagga tccagatctg 3600
ctgtgccttc tagttgccag ccatctgttg tttgcccctc ccccgtgcct tccttgaccc 3660
tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca tcgcattgtc 3720
tgagtaggtg tcattctatt ctgggggggtg gggtggggca ggacagcaag ggggaggatt 3780
gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc caggtgctga 3840
agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt ctctgtgaca 3900

caccctgtcc acgcccctgg ttcttagttc cagccccact cataggacac tcatagctca 3960
ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct ccctccctca 4020
tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc aagataggct 4080
attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga gagaaatcat 4140
agaattttaa ggccatgatt taaggccatc atggccttaa tcttccgctt cctcgctcac 4200
tgactcgctg cgctcggtcg ttcggctgcg gcgagcggta tcagctcact caaaggcggt 4260
aatacggtta tccacagaat caggggataa cgcaggaaag aacatgtgag caaaaggcca 4320
gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata ggctccgccc 4380
ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc cgacaggact 4440
ataaagatac caggcgtttc cccctggaag ctccctcgtg cgctctcctg ttccgaccct 4500
gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc tttctcatag 4560
ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca 4620
cgaacccccc gttcagcccg accgctgcgc cttatccggt aactatcgtc ttgagtccaa 4680
cccggtaaga cacgacttat cgccactggc agcagccact ggtaacagga ttagcagagc 4740
gaggtatgta ggcggtgcta cagagttctt gaagtggtgg cctaactacg gctacactag 4800
aagaacagta tttggtatct gcgctctgct gaagccagtt accttcggaa aaagagttgg 4860
tagctcttga tccggcaaac aaaccaccgc tggtagcggt ggtttttttg tttgcaagca 4920
gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt ctacggggtc 4980
tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat tatcaaaaag 5040
gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct aaagtatata 5100
tgagtaaact tggtctgaca gttaccaatg cttaatcagt gaggcaccta tctcagcgat 5160
ctgtctattt cgttcatcca tagttgcctg actcgggggg ggggggcgct gaggtctgcc 5220
tcgtgaagaa ggtgttgctg actcatacca ggcctgaatc gccccatcat ccagccagaa 5280
agtgagggag ccacggttga tgagagcttt gttgtaggtg gaccagttgg tgattttgaa 5340
cttttgcttt gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa 5400
ctcagcaaaa gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc 5460
tgccagtgtt acaaccaatt aaccaattct gattagaaaa actcatcgag catcaaatga 5520
aactgcaatt tattcatatc aggattatca ataccatatt tttgaaaaag ccgtttctgt 5580
aatgaaggag aaaactcacc gaggcagttc cataggatgg caagatcctg gtatcggtct 5640
gcgattccga ctcgtccaac atcaatacaa cctattaatt tcccctcgtc aaaaataagg 5700
ttatcaagtg agaaatcacc atgagtgacg actgaatccg gtgagaatgg caaaagctta 5760
tgcatttctt tccagacttg ttcaacaggc cagccattac gctcgtcatc aaaatcactc 5820
gcatcaacca aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg 5880
ctgttaaaag gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc 5940
gcatcaacaa tattttcacc tgaatcagga tattcttcta atacctggaa tgctgttttc 6000
ccggggatcg cagtggtgag taaccatgca tcatcaggag tacggataaa atgcttgatg 6060
gtcggaagag gcataaattc cgtcagccag tttagtctga ccatctcatc tgtaacatca 6120
ttggcaacgc tacctttgcc atgtttcaga aacaactctg gcgcatcggg cttcccatac 6180
aatcgataga ttgtcgcacc tgattgcccg acattatcgc gagcccattt atacccatat 6240
aaatcagcat ccatgttgga atttaatcgc ggcctcgagc aagacgtttc ccgttgaata 6300
tggctcataa caccccttgt attactgttt atgtaagcag acagttttat tgttcatgat 6360
gatatatttt tatcttgtgc aatgtaacat cagagatttt gagacacaac gtggctttcc 6420
ccccccccc attattgaag catttatcag ggttattgtc tcatgagcgg atacatattt 6480
gaatgtattt agaaaaataa acaaataggg gttccgcgca catttccccg aaaagtgcca 6540
cctgacgtct aagaaaccat tattatcatg acattaacct ataaaaatag gcgtatcacg 6600
aggccctttc gtc 6613

<210> 69
<211> 6532
<212> DNA
<213> Artificial Sequence

<220>

<223> plasmid pVR1012x/s containing HIV genes

<400> 69

tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga atgcgcgtga 1920
aggagaagta ccagcacctg tggcgctggg gctggcgctg gggcaccatg ctgctgggca 1980
tgctgatgat ctgcagcgcc accgagaagc tgtgggtgac cgtgtactac ggcgtgcccg 2040
tgtggaagga ggccaccacc accctgctct gcgccagcga cgccaaggcc tacgacaccg 2100
aggtgcacaa cgtgtgggcc acccacgcct gcgtgcccac cgaccccaac ccccaggagg 2160
tggtgctggt gaacgtgacc gagaacttcg acatgtggaa gaacgacatg gtggagcaga 2220
tgcacgagga catcatcagc ctgtgggacc agagcctgaa gccctgcgtg aagctgaccc 2280
ccctgtgcgt gagcctgaag tgcaccgacg ctagcaccag ctgcaacacc agcgtgatca 2340
cccaggcctg ccccaaggtg agcttcgagc ccatccccaa ccactactgc gcccccgccg 2400
gcttcgccat cctgaagtgc aaggacaaga agttcaacgg caagggcccc tgcaccaacg 2460
tgagcaccgt gcagtgcacc cacggcatcc gccccgtggt gagcacccag ctgctgctga 2520
acggtagcct ggccgaggag gaggtggtga tccgcagcgc taacttcgcc gacaacgcca 2580
aggtgatcat cgtgcagctg aacgagagcg tggagatcaa ctgcacccgc gctagcgccc 2640
actgcaacct gagccgcgcc aagtggaacg acaccctgaa caagatcgtg atcaagctgc 2700
gcgagcagtt cggcaacaag accatcgtgt tcaagcacag cagcggcggc gaccccgaga 2760
tcgtgaccca cagcttcaac tgcggcggcg agttcttcta ctgcaacagc gctagcctgc 2820
cctgccgcat caagcagatc atcaacatgt ggcagaaggt gggcaaggcc atgtacgccc 2880
cccccatcag cggccagatc cgctgcagca gcaacatcac cggcctgctg ctgacccgcg 2940
acggcggcaa cagcaacaac gagagcgaga tcttccgtcc gggcggcggc gacatgcgcg 3000
acaactggcg cagcgagctg tacaagtaca aggtggtgaa gatcgagccc ctgggcgtgg 3060
cccccaccaa ggccaagctt accgtccagg cccgccagct gctgagcggc atcgtgcagc 3120

agcagaacaa cctgctgcgc gccatcgagg cccagcagca cctgctgcag ctgaccgtgt 3180
ggggcatcaa gcagctgcag gcccgcaccc tggccgtgga gcgctacctg aaggaccagc 3240
agcagctcga gcagatctgg aaccacacca cctggatgga gtgggaccgc gagatcaaca 3300
actacaccag cctgatccac agcctgatcg aggagagcca gaaccagcag gagaagaacg 3360
agcaggagct gctggagctg gacaagtggg ccagcctgtg gaactggttc aacatcacca 3420
actggctgtg gtacatcaag ctgttcatca tgatcgtggg cggcctggtg ggcctgcgca 3480
tcgtgttcgc cgtgctgagc atctgaggat ccagatctgc tgtgccttct agttgccagc 3540
catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg 3600
tcctttccta ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc 3660
tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg 3720
ctggggatgc ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct 3780
gggccagaaa gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt 3840
tcttagttcc agccccactc ataggacact catagctcag gagggctccg ccttcaatcc 3900
cacccgctaa agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct 3960
agcctccaag agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa 4020
aatgcctcca acatgtgagg aagtaatgag agaaatcata gaattttaag gccatgattt 4080
aaggccatca tggccttaat cttccgcttc ctcgctcact gactcgctgc gctcggtcgt 4140
tcggctgcgg cgagcggtat cagctcactc aaaggcggta atacggttat ccacagaatc 4200
aggggataac gcaggaaaga acatgtgagc aaaaggccag caaaaggcca ggaaccgtaa 4260
aaaggccgcg ttgctggcgt ttttccatag gctccgcccc cctgacgagc atcacaaaaa 4320
tcgacgctca agtcagaggt ggcgaaaccc gacaggacta taaagatacc aggcgtttcc 4380
ccctggaagc tccctcgtgc gctctcctgt tccgaccctg ccgcttaccg gatacctgtc 4440
cgcctttctc ccttcgggaa gcgtggcgct ttctcatagc tcacgctgta ggtatctcag 4500
ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac gaacccccccg ttcagcccga 4560
ccgctgcgcc ttatccggta actatcgtct tgagtccaac ccggtaagac acgacttatc 4620
gccactggca gcagccactg gtaacaggat tagcagagcg aggtatgtag gcggtgctac 4680
agagttcttg aagtggtggc ctaactacgg ctacactaga agaacagtat ttggtatctg 4740
cgctctgctg aagccagtta ccttcggaaa aagagttggt agctcttgat ccggcaaaca 4800
aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag cagattacgc gcagaaaaaa 4860
aggatctcaa gaagatcctt tgatcttttc tacggggtct gacgctcagt ggaacgaaaa 4920
ctcacgttaa gggattttgg tcatgagatt atcaaaaagg atcttcacct agatcctttt 4980
aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaactt ggtctgacag 5040
ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc tgtctatttc gttcatccat 5100
agttgcctga ctcgggggggg gggggcgctg aggtctgcct cgtgaagaag gtgttgctga 5160
ctcataccag gcctgaatcg ccccatcatc cagccagaaa gtgagggagc cacggttgat 5220
gagagctttg ttgtaggtgg accagttggt gattttgaac ttttgctttg ccacggaacg 5280
gtctgcgttg tcgggaagat gcgtgatctg atccttcaac tcagcaaaag ttcgatttat 5340
tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct gccagtgtta caaccaatta 5400
accaattctg attagaaaaa ctcatcgagc atcaaatgaa actgcaattt attcatatca 5460
ggattatcaa taccatattt ttgaaaaagc cgtttctgta atgaaggaga aaactcaccg 5520
aggcagttcc ataggatggc aagatcctgg tatcggtctg cgattccgac tcgtccaaca 5580
tcaatacaac ctattaattt cccctcgtca aaaataaggt tatcaagtga gaaatcacca 5640
tgagtgacga ctgaatccgg tgagaatggc aaaagcttat gcatttcttt ccagacttgt 5700
tcaacaggcc agccattacg ctcgtcatca aaatcactcg catcaaccaa accgttattc 5760
attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc tgttaaaagg acaattacaa 5820
acaggaatcg aatgcaaccg gcgcaggaac actgccagcg catcaacaat attttcacct 5880
gaatcaggat attcttctaa tacctggaat gctgttttcc cggggatcgc agtggtgagt 5940
aaccatgcat catcaggagt acggataaaa tgcttgatgg tcggaagagg cataaattcc 6000
gtcagccagt ttagtctgac catctcatct gtaacatcat tggcaacgct accttgcca 6060
tgtttcagaa acaactctgg cgcatcgggc ttcccataca atcgatagat tgtcgcacct 6120
gattgcccga cattatcgcg agcccattta tacccatata aatcagcatc catgttggaa 6180
tttaatcgcg gcctcgagca agacgtttcc cgttgaatat ggctcataac acccccttgta 6240
ttactgttta tgtaagcaga cagttttatt gttcatgatg atatattttt atcttgtgca 6300
atgtaacatc agagattttg agacacaacg tggctttccc ccccccccca ttattgaagc 6360
atttatcagg gttattgtct catgagcgga tacatatttg aatgtattta gaaaaataaa 6420

caaatagggg ttccgcgcac atttccccga aaagtgccac ctgacgtcta agaaaccatt 6480
attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg tc 6532

<210> 70
<211> 7181
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 70
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga acaccatgcg 1920
cgtgaaggag aagtaccagc acctgtggcg ctggggctgg cgctggggca ccatgctgct 1980
gggcatgctg atgatctgca gcgccaccga gaagctgtgg gtgaccgtgt actacggcgt 2040
gcccgtgtgg aaggaggcca ccaccaccct gctctgcgcc agcgacgcca aggcctacga 2100
caccgaggtg cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaaccccca 2160
ggaggtggtg ctggtgaacg tgaccgagaa cttcgacatg tggaagaacg acatggtgga 2220
gcagatgcac gaggacatca tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct 2280
gaccccctg tgcgtgagcc tgaagtgcac cgacctgaag aacgacacca acaccaacag 2340
cagcagcggc cgcatgatca tggagaaggg cgagatcaag aactgcagct tcaacatcag 2400
caccagcatc cgcggcaagg tgcagaagga gtacgccttc ttctacaagc tggacatcat 2460

ccccatcgac aacgacacca ccagctacag cctgaccagc tgcaacacca gcgtgatcac 2520
ccaggcctgc cccaaggtga gcttcgagcc catccccaac cactactgcg cccccgccgg 2580
cttcaccatc ctgaagtgca aggacaagaa gttcaacggc aagggccccc gcaccaacgt 2640
gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg agcacccagc tgctgctgaa 2700
cgaccgcctg gccgaggagg aggtggtgat ccgcagcgcc aacttcgccg acaacgccaa 2760
ggtgatcatc gtgcagctga acgagagcgt ggagatcaac tgcacccgcc ccaacaacaa 2820
cacccgcaag agcatccaca tcggcccccgg ccgcgccttc tacaccaccg gcgagatcat 2880
cggcgacatc cgccaggccc actgcaacct gagccgcgcc aagtggaacg acaccctgaa 2940
caagatcgtg atcaagctgc gcgagcagtt cggcaacaag accatcgtgt tcaagcacag 3000
cagcggcggc gaccccgaga tcgtgaccca cagcttcaac tgcggcggcg agttcttcta 3060
ctgcaacagc acccagctgt tcaacagcac ctggttcaac agcacctgga gcaccgaggg 3120
cagcaacaac accgagggca gcgacaccat caccctgccc tgccgcatca agcagatcat 3180
caacatgtgg cagaaggtgg gcaaggccat gtacgccccc cccatcagcg gccagatccg 3240
ctgcagcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaaca gcaacaacga 3300
gagcgagatc ttccgcctgg gcggcggcga catgcgcgac aactggcgca gcgagctgta 3360
caagtacaag gtggtgaaga tcgagcccct gggcgtggcc cccaccaagg ccaagcgccg 3420
cgtggtgcag cgcgagaagc gcgccgtggg catcggcgcc ctgttcctgg gcttcctggg 3480
cgccgccggc agcaccatgg gcgccgccag catgaccctg accgtgcagg cccgccagct 3540
gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg cccagcagca 3600
cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc tggccgtgga 3660
gcgctacctg aaggaccagc agctgctggg catctggggc tgcagcggca agcttatctg 3720
caccaccgcc gtgccctgga acgccagctg gagcaacaag agcctggagc agatctggaa 3780
ccacaccacc tggatggagt gggaccgcga gatcaacaac tacaccagcc tgatccacag 3840
cctgatcgag gagagccaga accagcagga gaagaacgag caggagctgc tggagctgga 3900
caagtgggcc agcctgtgga actggttcaa catcaccaac tggctgtggt acatcaagct 3960
gttcatcatg atcgtgggcg gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat 4020
cgtgaaccgc gtgcgccagg gctacagccc cctgagcttc cagacccacc tgcccatccc 4080
ccgcggcccc gaccgccccg agggcatcga ggaggagggc ggcgagcgcg accgcgaccg 4140
cacgatccgc ctggtgaacg gcagctgagg atccagatct gctgtgcctt ctagttgcca 4200
gccatctgtt gtttgccccc cccccgtgcc ttccttgacc ctggaaggtg ccactcccac 4260
tgtcctttcc taataaaatg aggaaattgc atcgcattgt ctgagtaggt gtcattctat 4320
tctgggggggt ggggtggggc aggacagcaa gggggaggat tgggaagaca atagcaggca 4380
tgctggggat gcggtgggct ctatgggtac ccaggtgctg aagaattgac ccggttcctc 4440
ctgggccaga aagaagcagg cacatccccct tctctgtgac acaccctgtc cacgcccctg 4500
gttcttagtt ccagccccac tcataggaca ctcatagctc aggagggctc cgccttcaat 4560
cccacccgct aaagtacttg gagcggtctc tccctccctc atcagcccac caaaccaaac 4620
ctagcctcca agagtgggaa gaaattaaag caagataggc tattaagtgc agagggagag 4680
aaaatgcctc caacatgtga ggaagtaatg agagaaatca tagaatttta aggccatcat 4740
ggccttaatc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc 4800
gagcggtatc agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg 4860
caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 4920
tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa 4980
gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct 5040
ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc 5100
cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg 5160
tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt tcagcccgac cgctgcgcct 5220
tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag 5280
cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga 5340
agtggtggcc taactacggc tacactagaa gaacagtatt tggtatctgc gctctgctga 5400
agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg 5460
gtagcggtgg ttttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag 5520
aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag 5580
ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat 5640
gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct 5700
taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac 5760

tcgggggggg ggggcgctga ggtctgcctc gtgaagaagg tgttgctgac tcataccagg 5820
cctgaatcgc cccatcatcc agccagaaag tgagggagcc acggttgatg agagctttgt 5880
tgtaggtgga ccagttggtg attttgaact tttgctttgc cacggaacgg tctgcgttgt 5940
cgggaagatg cgtgatctga tccttcaact cagcaaaagt tcgatttatt caacaaagcc 6000
gccgtcccgt caagtcagcg taatgctctg ccagtgttac aaccaattaa ccaattctga 6060
ttagaaaaac tcatcgagca tcaaatgaaa ctgcaattta ttcatatcag gattatcaat 6120
accatatttt tgaaaaagcc gtttctgtaa tgaaggagaa aactcaccga ggcagttcca 6180
taggatggca agatcctggt atcggtctgc gattccgact cgtccaacat caatacaacc 6240
tattaatttc ccctcgtcaa aaataaggtt atcaagtgag aaatcaccat gagtgacgac 6300
tgaatccggt gagaatggca aaagcttatg catttctttc cagacttgtt caacaggcca 6360
gccattacgc tcgtcatcaa aatcactcgc atcaaccaaa ccgttattca ttcgtgattg 6420
cgcctgagcg agacgaaata cgcgatcgct gttaaaagga caattacaaa caggaatcga 6480
atgcaaccgg cgcaggaaca ctgccagcgc atcaacaata ttttcacctg aatcaggata 6540
ttcttctaat acctggaatg ctgttttccc ggggatcgca gtggtgagta accatgcatc 6600
atcaggagta cggataaaat gcttgatggt cggaagaggc ataaattccg tcagccagtt 6660
tagtctgacc atctcatctg taacatcatt ggcaacgcta cctttgccat gtttcagaaa 6720
caactctggc gcatcgggct tcccatacaa tcgatagatt gtcgcacctg attgcccgac 6780
attatcgcga gcccatttat acccatataa atcagcatcc atgttggaat ttaatcgcgg 6840
cctcgagcaa gacgtttccc gttgaatatg gctcataaca ccccttgtat tactgtttat 6900
gtaagcagac agttttattg ttcatgatga tatattttta tcttgtgcaa tgtaacatca 6960
gagattttga gacacaacgt ggctttcccc ccccccccat tattgaagca tttatcaggg 7020
ttattgtctc atgagcggat acatatttga atgtatttag aaaaataaac aaataggggt 7080
tccgcgcaca tttccccgaa aagtgccacc tgacgtctaa gaaaccatta ttatcatgac 7140
attaacctat aaaaataggc gtatcacgag gccctttcgt c 7181

<210> 71
<211> 7493
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 71
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140

taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga acaccatgcg 1920
cgtgaaggag aagtaccagc acctgtggcg ctggggctgg cgctggggca ccatgctgct 1980
gggcatgctg atgatctgca gcgccaccga gaagctgtgg gtgaccgtgt actacggcgt 2040
gcccgtgtgg aaggaggcca ccaccaccct gctctgcgcc agcgacgcca aggcctacga 2100
caccgaggtg cacaacgtgt gggccaccca cgcctgcgtg cccaccgacc ccaaccccca 2160
ggaggtggtg ctggtgaacg tgaccgagaa cttcgacatg tggaagaacg acatggtgga 2220
gcagatgcac gaggacatca tcagcctgtg ggaccagagc ctgaagccct gcgtgaagct 2280
gaccccctg tgcgtgagcc tgaagtgcac cgacctgaag aacgacacca acaccaacag 2340
cagcagcggc cgcatgatca tggagaaggg cgagatcaag aactgcagct tcaacatcag 2400
caccagcatc cgcggcaagg tgcagaagga gtacgccttc ttctacaagc tggacatcat 2460
ccccatcgac aacgacacca ccagctacag cctgaccagc tgcaacacca gcgtgatcac 2520
ccaggcctgc cccaaggtga gcttcgagcc catccccaac cactactgcg cccccgccgg 2580
cttcaccatc ctgaagtgca aggacaagaa gttcaacggc aagggccccc gcaccaacgt 2640
gagcaccgtg cagtgcaccc acggcatccg ccccgtggtg agcacccagc tgctgctgaa 2700
cgaccgcctg gccgaggagg aggtggtgat ccgcagcgcc aacttcgccg acaacgccaa 2760
ggtgatcatc gtgcagctga acgagagcgt ggagatcaac tgcacccgcc ccaacaacaa 2820
cacccgcaag agcatccaca tcggccccgg ccgcgccttc tacaccaccg gcgagatcat 2880
cggcgacatc cgccaggccc actgcaacct gagccgcgcc aagtggaacg acaccctgaa 2940
caagatcgtg atcaagctgc gcgagcagtt cggcaacaag accatcgtgt tcaagcacag 3000
cagcggcggc gaccccgaga tcgtgaccca cagcttcaac tgcggcggcg agttcttcta 3060
ctgcaacagc acccagctgt tcaacagcac ctggttcaac agcacctgga gcaccgaggg 3120
cagcaacaac accgagggca gcgacaccat caccctgccc tgccgcatca agcagatcat 3180
caacatgtgg cagaaggtgg gcaaggccat gtacgccccc cccatcagcg gccagatccg 3240
ctgcagcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaaca gcaacaacga 3300
gagcgagatc ttccgcctgg gcggcggcga catgcgcgac aactggcgca gcgagctgta 3360
caagtacaag gtggtgaaga tcgagcccct gggcgtggcc cccaccaagg ccaagcgccg 3420
cgtggtgcag cgcgagaagc gcgccgtggg catcggcgcc ctgttcctgg gcttcctggg 3480
cgccgccggc agcaccatgg gcgccgccag catgaccctg accgtgcagg cccgccagct 3540
gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg cccagcagca 3600
cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc tggccgtgga 3660
gcgctacctg aaggaccagc agctgctggg catctggggc tgcagcggca agcttatctg 3720
caccaccgcc gtgccctgga acgccagctg gagcaacaag agcctggagc agatctggaa 3780
ccacaccacc tggatggagt gggaccgcga gatcaacaac tacaccagcc tgatccacag 3840
cctgatcgag gagagccaga accagcagga gaagaacgag caggagctgc tggagctgga 3900
caagtgggcc agcctgtgga actggttcaa catcaccaac tggctgtggt acatcaagct 3960
gttcatcatg atcgtgggcg gcctggtggg cctgcgcatc gtgttcgccg tgctgagcat 4020
cgtgaaccgc gtgcgccagg gctacagccc cctgagcttc cagacccacc tgcccatccc 4080
ccgcggcccc gaccgccccg agggcatcga ggaggagggc ggcgagcgcg accgcgaccg 4140
cacgatccgc ctggtgaacg gcagcctggc cctgatctgg gacgacctgc gcagcctgtg 4200
cctgttcagc taccaccgcc tgcgcgacct gctgctgatc gtgacccgca tcgtggagct 4260
gctgggccgc cgcggctggg aggccctgaa gtactggtgg aacctgctgc agtactggag 4320
ccaggagctg aagaacagcg ccgtgagcct gctgaacgcc accgccatcg ccgtggccga 4380
gggcaccgac cgcgtgatcg aggtggtgca gggcgcctgc cgcgccatcc gccacatccc 4440

ccgccgcatc cgccagggcc tggagcgcat cctgctgtga ggatccagat ctgctgtgcc 4500
ttctagttgc cagccatctg ttgtttgccc ctccccccgtg ccttccttga ccctggaagg 4560
tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag 4620
gtgtcattct attctggggg gtggggtggg gcaggacagc aaggggggagg attgggaaga 4680
caatagcagg catgctgggg atgcggtggg ctctatgggt acccaggtgc tgaagaattg 4740
acccggttcc tcctgggcca gaaagaagca ggcacatccc cttctctgtg acacaccctg 4800
tccacgcccc tggttcttag ttccagcccc actcatagga cactcatagc tcaggagggc 4860
tccgccttca atcccacccg ctaaagtact tggagcggtc tctccctccc tcatcagccc 4920
accaaaccaa acctagcctc caagagtggg aagaaattaa agcaagatag gctattaagt 4980
gcagagggag agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat catagaattt 5040
taaggccatc atggccttaa tcttccgctt cctcgctcac tgactcgctg cgctcggtcg 5100
ttcggctgcg gcgagcggta tcagctcact caaaggcggt aatacggtta tccacagaat 5160
caggggataa cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta 5220
aaaaggccgc gttgctggcg tttttccata ggctccgccc ccctgacgag catcacaaaa 5280
atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgtttc 5340
cccctggaag ctccctcgtg cgctctcctg ttccgaccct gccgcttacc ggatacctgt 5400
ccgcctttct cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca 5460
gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc gttcagcccg 5520
accgctgcgc cttatccggt aactatcgtc ttgagtccaa cccggtaaga cacgacttat 5580
cgccactggc agcagccact ggtaacagga ttagcagagc gaggtatgta ggcggtgcta 5640
cagagttctt gaagtggtgg cctaactacg gctacactag aagaacagta tttggtatct 5700
gcgctctgct gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac 5760
aaaccaccgc tggtagcggt ggtttttttg tttgcaagca gcagattacg cgcagaaaaa 5820
aaggatctca agaagatcct ttgatctttt ctacggggtc tgacgctcag tggaacgaaa 5880
actcacgtta agggattttg gtcatgagat tatcaaaaag gatcttcacc tagatccttt 5940
taaattaaaa atgaagtttt aaatcaatct aaagtatata tgagtaaact tggtctgaca 6000
gttaccaatg cttaatcagt gaggcaccta tctcagcgat ctgtctattt cgttcatcca 6060
tagttgcctg actcgggggg gggggcgct gaggtctgcc tcgtgaagaa ggtgttgctg 6120
actcatacca ggcctgaatc gccccatcat ccagccagaa agtgagggag ccacggttga 6180
tgagagcttt gttgtaggtg gaccagttgg tgattttgaa cttttgcttt gccacggaac 6240
ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa ctcagcaaaa gttcgattta 6300
ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc tgccagtgtt acaaccaatt 6360
aaccaattct gattagaaaa actcatcgag catcaaatga aactgcaatt tattcatatc 6420
aggattatca ataccatatt tttgaaaaag ccgtttctgt aatgaaggag aaaactcacc 6480
gaggcagttc cataggatgg caagatcctg gtatcggtct gcgattccga ctcgtccaac 6540
atcaatacaa cctattaatt tcccctcgtc aaaaataagg ttatcaagtg agaaatcacc 6600
atgagtgacg actgaatccg gtgagaatgg caaaagctta tgcatttctt tccagacttg 6660
ttcaacaggc cagccattac gctcgtcatc aaaatcactc gcatcaacca aaccgttatt 6720
cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg ctgttaaaag gacaattaca 6780
aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc gcatcaacaa tattttcacc 6840
tgaatcagga tattcttcta atacctggaa tgctgttttc ccggggatcg cagtggtgag 6900
taaccatgca tcatcaggag tacggataaa atgcttgatg gtcggaagag gcataaattc 6960
cgtcagccag tttagtctga ccatctcatc tgtaacatca ttggcaacgc tacctttgcc 7020
atgtttcaga aacaactctg gcgcatcggg cttcccatac aatcgataga ttgtcgcacc 7080
tgattgcccg acattatcgc gagcccattt atacccatat aaatcagcat ccatgttgga 7140
atttaatcgc ggcctcgagc aagacgtttc ccgttgaata tggctcataa caccccttgt 7200
attactgttt atgtaagcag acagttttat tgttcatgat gatatatttt tatcttgtgc 7260
aatgtaacat cagagatttt gagacacaac gtggctttcc ccccccccc attattgaag 7320
catttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt agaaaaataa 7380
acaaataggg gttccgcgca catttccccg aaaagtgcca cctgacgtct aagaaaccat 7440
tattatcatg acattaacct ataaaaatag gcgtatcacg aggccctttc gtc 7493

<210> 72

<211> 7186
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 72
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820

acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agccccctga gcttccagac ccacctgccc 4080
atcccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc tgaggatcca gatctgctgt gccttctagt 4200
tgccagccat ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact 4260
cccactgtcc tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat 4320
tctattctgg ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc 4380
aggcatgctg gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt 4440
tcctcctggg ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc 4500
ccctggttct tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct 4560
tcaatcccac ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac 4620
caaacctagc ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg 4680
gagagaaaat gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc 4740
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4800
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4860
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4920
cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca aaaatcgacg 4980
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 5040
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 5100
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 5160
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 5220
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 5280
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 5340
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 5400
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 5460
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 5520
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 5580
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5640
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5700
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5760
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5820
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5880
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5940
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 6000
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 6060
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 6120

tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 6180
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 6240
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 6300
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 6360
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 6420
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 6480
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 6540
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6600
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6660
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6720
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6780
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6840
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6900
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6960
catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 7020
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 7080
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 7140
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 7186

<210> 73
<211> 7003
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 73
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500

agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cttaccgtgc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3480
cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3540
caggcccgca tcctggccgt ggagcgctac ctgaaggacc agcagctgga gcagatctgg 3600
aaccacacca cctggatgga gtgggaccgc gagatcaaca actacaccag cctgatccac 3660
agcctgatcg aggagagcca gaaccagcag gagaagaacg agcaggagct gctggagctg 3720
gacaagtggg ccagcctgtg gaactggttc aacatcacca actggctgtg gtacatcaag 3780
ctgttcatca tgatcgtggg cggcctggtg ggcctgcgca tcgtgttcgc cgtgctgagc 3840
atcgtgaacc gcgtgcgcca gggctacagc cccctgagct tccagaccca cctgcccatc 3900
ccccgcggcc ccgaccgccc cgagggcatc gaggaggagg gcggcgagcg cgaccgcgac 3960
cgcacgatcc gcctggtgaa cggcagctga ggatccagat ctgctgtgcc ttctagttgc 4020
cagccatctg ttgtttgccc ctccccccgtg ccttccttga ccctggaagg tgccactccc 4080
actgtccttt cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct 4140
attctggggg gtggggtggg gcaggacagc aaggggagg attgggaaga caatagcagg 4200
catgctgggg atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc 4260
tcctgggcca gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc 4320
tggttcttag ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca 4380
atcccacccg ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa 4440
acctagcctc caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag 4500
agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatc 4560
atggccttaa tcttccgctt cctcgctcac tgactcgctg cgctcggtcg ttcggctgcg 4620
gcgagcggta tcagctcact caaaggcggt aatacggtta tccacagaat caggggataa 4680
cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc 4740
gttgctggcg tttttccata ggctccgccc ccctgacgag catcacaaaa atcgacgctc 4800

aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgtttc cccctggaag 4860
ctccctcgtg cgctctcctg ttccgaccct gccgcttacc ggatacctgt ccgcctttct 4920
cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca gttcggtgta 4980
ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc gttcagcccg accgctgcgc 5040
cttatccggt aactatcgtc ttgagtccaa cccggtaaga cacgacttat cgccactggc 5100
agcagccact ggtaacagga ttagcagagc gaggtatgta ggcggtgcta cagagttctt 5160
gaagtggtgg cctaactacg gctacactag aagaacagta tttggtatct gcgctctgct 5220
gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac aaaccaccgc 5280
tggtagcggt ggtttttttg tttgcaagca gcagattacg cgcagaaaaa aaggatctca 5340
agaagatcct ttgatctttt ctacggggtc tgacgctcag tggaacgaaa actcacgtta 5400
agggattttg gtcatgagat tatcaaaaag gatcttcacc tagatccttt taaattaaaa 5460
atgaagtttt aaatcaatct aaagtatata tgagtaaact tggtctgaca gttaccaatg 5520
cttaatcagt gaggcaccta tctcagcgat ctgtctattt cgttcatcca tagttgcctg 5580
actcgggggg gggggcgct gaggtctgcc tcgtgaagaa ggtgttgctg actcatacca 5640
ggcctgaatc gccccatcat ccagccagaa agtgagggag ccacggttga tgagagcttt 5700
gttgtaggtg gaccagttgg tgattttgaa cttttgcttt gccacggaac ggtctgcgtt 5760
gtcgggaaga tgcgtgatct gatccttcaa ctcagcaaaa gttcgattta ttcaacaaag 5820
ccgccgtccc gtcaagtcag cgtaatgctc tgccagtgtt acaaccaatt aaccaattct 5880
gattagaaaa actcatcgag catcaaatga aactgcaatt tattcatatc aggattatca 5940
ataccatatt tttgaaaaag ccgtttctgt aatgaaggag aaaactcacc gaggcagttc 6000
cataggatgg caagatcctg gtatcggtct gcgattccga ctcgtccaac atcaatacaa 6060
cctattaatt tcccctcgtc aaaaataagg ttatcaagtg agaaatcacc atgagtgacg 6120
actgaatccg gtgagaatgg caaaagctta tgcatttctt tccagacttg ttcaacaggc 6180
cagccattac gctcgtcatc aaaatcactc gcatcaacca aaccgttatt cattcgtgat 6240
tgcgcctgag cgagacgaaa tacgcgatcg ctgttaaaag gacaattaca aacaggaatc 6300
gaatgcaacc ggcgcaggaa cactgccagc gcatcaacaa tattttcacc tgaatcagga 6360
tattcttcta atacctggaa tgctgttttc ccggggatcg cagtggtgag taaccatgca 6420
tcatcaggag tacggataaa atgcttgatg gtcggaagag gcataaattc cgtcagccag 6480
tttagtctga ccatctcatc tgtaacatca ttggcaacgc tacctttgcc atgtttcaga 6540
aacaactctg gcgcatcggg cttcccatac aatcgataga ttgtcgcacc tgattgcccg 6600
acattatcgc gagcccattt atacccatat aaatcagcat ccatgttgga atttaatcgc 6660
ggcctcgagc aagacgtttc ccgttgaata tggctcataa caccccttgt attactgttt 6720
atgtaagcag acagttttat tgttcatgat gatatatttt tatcttgtgc aatgtaacat 6780
cagagatttt gagacacaac gtggctttcc ccccccccc attattgaag catttatcag 6840
ggttattgtc tcatgagcgg atacatattt gaatgtattt agaaaaataa acaaataggg 6900
gttccgcgca catttccccg aaaagtgcca cctgacgtct aagaaaccat tattatcatg 6960
acattaacct ataaaaatag gcgtatcacg aggccctttc gtc 7003

<210> 74
<211> 7186
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 74
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360

ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgccccа ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtcgacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaagg actgtagctt cgacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcgaaactag tgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa cgacaagacc ttcgacggca ccgggccctg caccgacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtcg acttcaccga caacgccaag 2760
accatcatcg tgcaggtgga caccacggtg gagatcgatt gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcgat atcagccgcg ccaagtggga caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaacg acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgcg acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcgatat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660

gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agcccccctga gcttccagac ccacctgccc 4080
atcccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc tgaggatcca gatctgctgt gccttctagt 4200
tgccagccat ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact 4260
cccactgtcc tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat 4320
tctattctgg ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc 4380
aggcatgctg gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt 4440
tcctcctggg ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc 4500
ccctggttct tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct 4560
tcaatcccac ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac 4620
caaacctagc ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg 4680
gagagaaaat gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc 4740
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4800
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4860
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4920
cgcgttgctg gcgtttttcc ataggctccg cccccctgac gagcatcaca aaaatcgacg 4980
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 5040
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 5100
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 5160
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 5220
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 5280
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 5340
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 5400
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 5460
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 5520
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 5580
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5640
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5700
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5760
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5820
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5880
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5940
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 6000
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 6060
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 6120
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 6180
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 6240
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 6300
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 6360
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 6420
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 6480
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 6540
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6600
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6660
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6720
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6780
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6840
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6900
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6960

catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 7020
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 7080
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 7140
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 7186

<210> 75
<211> 7186
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 75
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtcgacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340

agcagcggcc gcatgatcat ggagaagggc gagatcaagg actgtagctt cgacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcgaaactag tgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa cgacaagacc ttcgacggca ccgggccctg caccgacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtcg acttcaccga caacgccaag 2760
accatcatcg tgcaggtgga caccacggtg gagatcgatt gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg cccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agccccctga gcttccagac ccacctgccc 4080
atccccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc tgaggatcca gatctgctgt gccttctagt 4200
tgccagccat ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact 4260
cccactgtcc tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat 4320
tctattctgg ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc 4380
aggcatgctg gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt 4440
tcctcctggg ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc 4500
ccctggttct tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct 4560
tcaatcccac ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac 4620
caaacctagc ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg 4680
gagagaaaat gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc 4740
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4800
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4860
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4920
cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca aaaatcgacg 4980
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 5040
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 5100
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 5160
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 5220
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 5280
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 5340
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 5400
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 5460
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 5520
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 5580
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5640

aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5700
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5760
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5820
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5880
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5940
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 6000
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 6060
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 6120
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 6180
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 6240
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 6300
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 6360
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 6420
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 6480
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 6540
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6600
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6660
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6720
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6780
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6840
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6900
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6960
catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 7020
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 7080
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 7140
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 7186

<210> 76
<211> 7498
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 76
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020

tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agcccccctga gcttccagac ccacctgccc 4080
atcccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc ctggccctga tctgggacga cctgcgcagc 4200
ctgtgcctgt tcagctacca ccgcctgcgc gacctgctgc tgatcgtgac ccgcatcgtg 4260
gagctgctgg gccgccgcgg ctgggaggcc ctgaagtact ggtggaacct gctgcagtac 4320

tggagccagg agctgaagaa cagcgccgtg agcctgctga acgccaccgc catcgccgtg 4380
gccgagggca ccgaccgcgt gatcgaggtg gtgcagggcg cctgccgcgc catccgccac 4440
atcccccgcc gcatccgcca gggcctggag cgcatcctgc tgtgaggatc cagatctgct 4500
gtgccttcta gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg 4560
gaaggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg 4620
agtaggtgtc attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg 4680
gaagacaata gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag 4740
aattgacccg gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca 4800
ccctgtccac gcccctggtt cttagttcca gccccactca taggacactc atagctcagg 4860
agggctccgc cttcaatccc acccgctaaa gtacttggag cggtctctcc ctcccctcatc 4920
agcccaccaa accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat 4980
taagtgcaga gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag 5040
aattttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 5100
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 5160
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 5220
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca 5280
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 5340
gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 5400
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 5460
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 5520
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 5580
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 5640
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 5700
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 5760
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5820
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5880
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5940
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 6000
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 6060
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 6120
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 6180
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 6240
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 6300
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 6360
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 6420
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 6480
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 6540
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 6600
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 6660
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 6720
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6780
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6840
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 6900
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6960
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 7020
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 7080
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 7140
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 7200
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 7260
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 7320
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 7380
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 7440
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 7498

<210> 77
<211> 7315
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 77
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtgaacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaaga actgcagctt caacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcaacaccag cgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa caacaagacc ttcaacggca ccggcccctg caccaacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700

ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtga acttcaccga caacgccaag 2760
accatcatcg tgcagctgaa caccagcgtg gagatcaact gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cttaccgtgc aggcccgcca gctgctgagc ggcatcgtgc agcagcagaa caacctgctg 3480
cgcgccatcg aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg 3540
caggcccgca tcctggccgt ggagcgctac ctgaaggacc agcagctgga gcagatctgg 3600
aaccacacca cctggatgga gtgggaccgc gagatcaaca actacaccag cctgatccac 3660
agcctgatcg aggagagcca gaaccagcag gagaagaacg agcaggagct gctggagctg 3720
gacaagtggg ccagcctgtg gaactggttc aacatcacca actggctgtg gtacatcaag 3780
ctgttcatca tgatcgtggg cggcctggtg ggcctgcgca tcgtgttcgc cgtgctgagc 3840
atcgtgaacc gcgtgcgcca gggctacagc cccctgagct tccagaccca cctgcccatc 3900
ccccgcggcc ccgaccgccc cgagggcatc gaggaggagg gcggcgagcg cgaccgcgac 3960
cgcacgatcc gcctggtgaa cggcagcctg gccctgatct gggacgacct gcgcagcctg 4020
tgcctgttca gctaccaccg cctgcgcgac ctgctgctga tcgtgacccg catcgtggag 4080
ctgctgggcc gccgcggctg ggaggccctg aagtactggt ggaacctgct gcagtactgg 4140
agccaggagc tgaagaacag cgccgtgagc ctgctgaacg ccaccgccat cgccgtggcc 4200
gagggcaccg accgcgtgat cgaggtggtg cagggcgcct gccgcgccat ccgccacatc 4260
ccccgccgca tccgccaggg cctggagcgc atcctgctgt gaggatccag atctgctgtg 4320
ccttctagtt gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa 4380
ggtgccactc ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt 4440
aggtgtcatt ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa 4500
gacaatagca ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat 4560
tgacccggtt cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc 4620
tgtccacgcc cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg 4680
gctccgcctt caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc 4740
ccaccaaacc aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa 4800
gtgcagaggg agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat 4860
tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc tgcgctcggt 4920
cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt tatccacaga 4980
atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg 5040
taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg agcatcacaa 5100
aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat accaggcgtt 5160
tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta ccggatacct 5220
gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct gtaggtatct 5280
cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc ccgttcagcc 5340
cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa gacacgactt 5400
atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg taggcggtgc 5460
tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag tatttggtat 5520
ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa 5580
acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa 5640
aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc agtggaacga 5700
aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca cctagatcct 5760
tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa cttggtctga 5820
cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat ttcgttcatc 5880
catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag aaggtgttgc 5940
tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg agccacggtt 6000

gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct ttgccacgga 6060
acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa aagttcgatt 6120
tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg ttacaaccaa 6180
ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa tttattcata 6240
tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg agaaaactca 6300
ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc gactcgtcca 6360
acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag tgagaaatca 6420
ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc tttccagact 6480
tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac caaaccgtta 6540
ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa aggacaatta 6600
caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac aatattttca 6660
cctgaatcag gatattcttc taatacctgg aatgctgttt tccccggggat cgcagtggtg 6720
agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag aggcataaat 6780
tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac gctacctttg 6840
ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata gattgtcgca 6900
cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc atccatgttg 6960
gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat aacacccctt 7020
gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt tttatcttgt 7080
gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc ccattattga 7140
agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat ttagaaaaat 7200
aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt ctaagaaacc 7260
attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt tcgtc 7315

<210> 78
<211> 7498
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 78
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260

tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtcgacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaagg actgtagctt cgacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcgaaactag tgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa cgacaagacc ttcgacggca ccgggccctg caccgacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtcg acttcaccga caacgccaag 2760
accatcatcg tgcaggtgga caccacggtg gagatcgatt gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcgat atcagccgcg ccaagtggga caacaccctg 2940
aagcagatcg acagcaagct gcgcgagcag ttcggcaacg acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgcg acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcgatat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agccccctga gcttccagac ccacctgccc 4080
atcccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc ctggccctga tctgggacga cctgcgcagc 4200
ctgtgcctgt tcagctacca ccgcctgcgc gacctgctgc tgatcgtgac ccgcatcgtg 4260
gagctgctgg gccgccgcgg ctgggaggcc ctgaagtact ggtggaacct gctgcagtac 4320
tggagccagg agctgaagaa cagcgccgtg agcctgctga acgccaccgc catcgccgtg 4380
gccgagggca ccgaccgcgt gatcgaggtg gtgcagggcg cctgccgcgc catccgccac 4440
atcccccgcc gcatccgcca gggcctggag cgcatcctgc tgtgaggatc cagatctgct 4500
gtgccttcta gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg 4560

gaaggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg 4620
agtaggtgtc attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg 4680
gaagacaata gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag 4740
aattgacccg gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca 4800
ccctgtccac gcccctggtt cttagttcca gccccactca taggacactc atagctcagg 4860
agggctccgc cttcaatccc acccgctaaa gtacttggag cggtctctcc ctccctcatc 4920
agcccaccaa accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat 4980
taagtgcaga gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag 5040
aattttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 5100
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 5160
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 5220
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca 5280
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 5340
gtttcccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 5400
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 5460
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac ccccgttca 5520
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 5580
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 5640
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 5700
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 5760
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5820
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5880
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5940
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 6000
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 6060
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 6120
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 6180
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 6240
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 6300
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 6360
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 6420
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 6480
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 6540
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 6600
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 6660
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 6720
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6780
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6840
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 6900
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6960
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 7020
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 7080
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 7140
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 7200
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 7260
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttcccccc cccccattat 7320
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 7380
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 7440
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 7498

<210> 79
<211> 7498
<212> DNA

<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 79
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga caccatgcgc 1920
gtgaaggaga agtaccagca cctgtggcgc tggggctggc gctggggcac catgctgctg 1980
ggcatgctga tgatctgcag cgccaccgag aagctgtggg tgaccgtgta ctacggcgtg 2040
cccgtgtgga aggaggccac caccaccctg ctctgcgcca gcgacgccaa ggcctacgac 2100
accgaggtgc acaacgtgtg ggccacccac gcctgcgtgc ccaccgaccc caacccccag 2160
gaggtggtgc tggtcgacgt gaccgagaac ttcgacatgt ggaagaacga catggtggag 2220
cagatgcacg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 2280
acccccctgt gcgtgagcct gaagtgcacc gacctgaaga acgacaccaa caccaacagc 2340
agcagcggcc gcatgatcat ggagaagggc gagatcaagg actgtagctt cgacatcagc 2400
accagcatcc gcggcaaggt gcagaaggag tacgccttct tctacaagct ggacatcatc 2460
cccatcgaca acgacaccac cagctacagc ctgaccagct gcgaaactag tgtgatcacc 2520
caggcctgcc ccaaggtgag cttcgagccc atccccaacc actactgcgc ccccgccggc 2580
ttcaccatcc tgaagtgcaa cgacaagacc ttcgacggca ccgggccctg caccgacgtg 2640
agcaccgtgc agtgcaccca cggcatccgc cccgtggtga gcacccagct gctgctgaac 2700
ggcagcctgg ccgaggagga ggtggtgatc cgcagcgtcg acttcaccga caacgccaag 2760
accatcatcg tgcaggtgga caccacggtg gagatcgatt gcacccgccc caacaacaac 2820
acccgcaagc gaattcgcat ccagcgcggc cccggccgcg ccttcgtgac catcggcaag 2880
atcggcaaca tgcgccaggc ccactgcaac atcagccgcg ccaagtggaa caacaccctg 2940

aagcagatcg acagcaagct gcgcgagcag ttcggcaaca acaagaccat catcttcaag 3000
cagagcagcg gcggcgaccc cgagatcgtg acccacagct tcaactgcgg cggcgagttc 3060
ttctactgca acagcaccca gctgttcaac agcacctggt tcaacagcac ctggagcacc 3120
gagggcagca acaacaccga gggcagcgac accatcaccc tgccctgccg catcaagcag 3180
atcatcaaca tgtggcagaa ggtgggcaag gccatgtacg ccccccccat cagcggccag 3240
atccgctgca gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caacagcaac 3300
aacgagagcg agatcttccg cctgggcggc ggcgacatgc gcgacaactg gcgcagcgag 3360
ctgtacaagt acaaggtggt gaagatcgag cccctgggcg tggcccccac caaggccaag 3420
cgccgcgtgg tgcagcgcga gaagcgcgcc gtgggcatcg gcgccctgtt cctgggcttc 3480
ctgggcgccg ccggcagcac catgggcgcc gccagcatga ccctgaccgt gcaggcccgc 3540
cagctgctga gcggcatcgt gcagcagcag aacaacctgc tgcgcgccat cgaggcccag 3600
cagcacctgc tgcagctgac cgtgtggggc atcaagcagc tgcaggcccg catcctggcc 3660
gtggagcgct acctgaagga ccagcagctg ctgggcatct ggggctgcag cggcaagctt 3720
atctgcacca ccgccgtgcc ctggaacgcc agctggagca acaagagcct ggagcagatc 3780
tggaaccaca ccacctggat ggagtgggac cgcgagatca acaactacac cagcctgatc 3840
cacagcctga tcgaggagag ccagaaccag caggagaaga acgagcagga gctgctggag 3900
ctggacaagt gggccagcct gtggaactgg ttcaacatca ccaactggct gtggtacatc 3960
aagctgttca tcatgatcgt gggcggcctg gtgggcctgc gcatcgtgtt cgccgtgctg 4020
agcatcgtga accgcgtgcg ccagggctac agccccctga gcttccagac ccacctgccc 4080
atcccccgcg gccccgaccg ccccgagggc atcgaggagg agggcggcga gcgcgaccgc 4140
gaccgcacga tccgcctggt gaacggcagc ctggccctga tctgggacga cctgcgcagc 4200
ctgtgcctgt tcagctacca ccgcctgcgc gacctgctgc tgatcgtgac ccgcatcgtg 4260
gagctgctgg gccgccgcgg ctgggaggcc ctgaagtact ggtggaacct gctgcagtac 4320
tggagccagg agctgaagaa cagcgccgtg agcctgctga acgccaccgc catcgccgtg 4380
gccgagggca ccgaccgcgt gatcgaggtg gtgcagggcg cctgccgcgc catccgccac 4440
atcccccgcc gcatccgcca gggcctggag cgcatcctgc tgtgaggatc cagatctgct 4500
gtgccttcta gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg 4560
gaaggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg 4620
agtaggtgtc attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg 4680
gaagacaata gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag 4740
aattgacccg gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca 4800
ccctgtccac gcccctggtt cttagttcca gccccactca taggacactc atagctcagg 4860
agggctccgc cttcaatccc acccgctaaa gtacttggag cggtctctcc ctccctcatc 4920
agcccaccaa accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat 4980
taagtgcaga gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag 5040
aattttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 5100
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 5160
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 5220
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccccctg acgagcatca 5280
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 5340
gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 5400
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 5460
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 5520
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 5580
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 5640
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 5700
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 5760
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5820
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5880
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5940
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 6000
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 6060
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 6120
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 6180
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 6240

ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 6300
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 6360
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 6420
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 6480
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 6540
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 6600
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 6660
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 6720
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6780
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6840
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccccgg gatcgcagtg 6900
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6960
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 7020
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 7080
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 7140
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 7200
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 7260
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 7320
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 7380
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 7440
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 7498

<210> 80
<211> 5549
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 80
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320

ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga ccaccatggg 1920
cggcaagtgg agcaagagca gcgtgatcgg ctggcccgcc gtgcgcgagc gcatgcgccg 1980
cgccgagccc gccgccgacg gcgtgggcgc cgtgagccgc gacctggaga agcacggcgc 2040
catcaccagc agcaacaccg ccgccaacaa cgccgcctgc gcctggctgg aggcccagga 2100
ggaggaggag gtgggcttcc ccgtgacccc ccaggtgccc ctgcgcccca tgacctacaa 2160
ggccgccgtg gacctgagcc acttcctgaa ggagaagggc ggcctggagg gcctgatcca 2220
cagccagcgc cgccaggaca tcctggacct gtggatctac cacacccagg gctacttccc 2280
cgactggcag aactacaccc ccggccccgg cgtgcgctac cccctgacct tcggctggtg 2340
ctacaagctg gtgcccgtgg agcccgacaa ggtggaggag gccaacaagg gcgagaacac 2400
cagcctgctg caccccgtga gcctgcacgg catggacgac cccgagcgcg aggtgctgga 2460
gtggcgcttc gacagccgcc tggccttcca ccacgtggcc cgcgagctgc accccgagta 2520
cttcaagaac tgctgaggat ccagatctgc tgtgccttct agttgccagc catctgttgt 2580
ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttcctа 2640
ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg 2700
ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc 2760
ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa 2820
gaagcaggca catcccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc 2880
agccccactc ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa 2940
agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag 3000
agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca 3060
acatgtgagg aagtaatgag agaaatcata gaattttaag gccatcatgg ccttaatctt 3120
ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag 3180
ctcactcaaa ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca 3240
tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 3300
tccataggct ccgccccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 3360
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 3420
ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 3480
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 3540
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact 3600
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 3660
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 3720
actacggcta cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct 3780
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 3840
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 3900
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 3960
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 4020
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 4080
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag 4140
ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc 4200
catcatccag ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc 4260
agttggtgat tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg 4320
tgatctgatc cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca 4380
agtcagcgta atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc 4440
atcgagcatc aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg 4500
aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag 4560
atcctggtat cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc 4620

ctcgtcaaaa ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga 4680
gaatggcaaa agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc 4740
gtcatcaaaa tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag 4800
acgaaatacg cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg 4860
caggaacact gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac 4920
ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg 4980
gataaaatgc ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat 5040
ctcatctgta acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc 5100
atcgggcttc ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc 5160
ccatttatac ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga 5220
cgtttcccgt tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag 5280
ttttattgtt catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga 5340
cacaacgtgg ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat 5400
gagcggatac atatttgaat gtatttagaa aaataaacaa ataggggttc cgcgcacatt 5460
tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa 5520
aaataggcgt atcacgaggc cctttcgtc 5549

<210> 81
<211> 5549
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 81
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620

gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga ccaccatggg 1920
cggcaagtgg agcaagagca gcgtgatcgg ctggcccgcc gtgcgcgagc gcatgcgccg 1980
cgccgagccc gccgccgacg gcgtgggcgc cgtgagccgc gacctggaga agcacggcgc 2040
catcaccagc agcaacaccg ccgccaacaa cgccgcctgc gcctggctgg aggcccagga 2100
ggaggaggag gtgggcttcg cagtgaccgc acaggtggca ctgcgcgcaa tgacctacaa 2160
ggccgccgtg gacctgagcc acttcctgaa ggagaagggc ggcctggagg gcctgatcca 2220
cagccagcgc cgccaggaca tcctggacct gtggatctac cacacccagg gctacttccc 2280
cgactggcag aactacaccc ccggccccgg cgtgcgctac cccctgacct tcggctggtg 2340
ctacaagctg gtgcccgtgg agcccgacaa ggtggaggag gccaacaagg gcgagaacac 2400
cagcctgctg caccccgtga gcctgcacgg catggcagca cccgagcgcg aggtgctgga 2460
gtggcgcttc gacagccgcc tggccttcca ccacgtggcc cgcgagctgc accccgagta 2520
cttcaagaac tgctgaggat ccagatctgc tgtgccttct agttgccagc catctgttgt 2580
ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta 2640
ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg 2700
ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc 2760
ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa 2820
gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc 2880
agccccactc ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa 2940
agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag 3000
agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca 3060
acatgtgagg aagtaatgag agaaatcata gaattttaag gccatcatgg ccttaatctt 3120
ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag 3180
ctcactcaaa ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca 3240
tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 3300
tccataggct ccgccccccc gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 3360
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 3420
ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 3480
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 3540
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact 3600
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 3660
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 3720
actacggcta cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct 3780
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 3840
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 3900
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 3960
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 4020
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 4080
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggggg 4140
ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc 4200
catcatccag ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc 4260
agttggtgat tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg 4320
tgatctgatc cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca 4380
agtcagcgta atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc 4440
atcgagcatc aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg 4500
aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag 4560
atcctggtat cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc 4620
ctcgtcaaaa ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga 4680
gaatggcaaa agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc 4740
gtcatcaaaa tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag 4800
acgaaatacg cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg 4860
caggaacact gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac 4920

ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg 4980
gataaaatgc ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat 5040
ctcatctgta acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc 5100
atcgggcttc ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc 5160
ccatttatac ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga 5220
cgtttcccgt tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag 5280
ttttattgtt catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga 5340
cacaacgtgg ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat 5400
gagcggatac atatttgaat gtatttagaa aaataaacaa atagggggttc cgcgcacatt 5460
tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa 5520
aaataggcgt atcacgaggc cctttcgtc 5549

<210> 82
<211> 5549
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 82
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga ccaccatggg 1920

cggcaagtgg agcaagagca gcgtgatcgg ctggcccgcc gtgcgcgagc gcatgcgccg 1980
cgccgagccc gccgccgacg gcgtgggcgc cgtgagccgc gacctggaga agcacggcgc 2040
catcaccagc agcaacaccg ccgccaacaa cgccgcctgc gcctggctgg aggcccagga 2100
ggaggaggag gtgggcttcc ccgtgacccc ccaggtgccc ctgcgcccca tgacctacaa 2160
ggccgccgtg gacctgagcc acttcctgaa ggagaagggc ggcctggagg gcctgatcca 2220
cagccagcgc cgccaggaca tcctggacct gtggatctac cacacccagg gctacttccc 2280
cgactggcag aactacaccc ccggccccgg cgtgcgctac cccctgacct tcggctggtg 2340
ctacaagctg gtgcccgtgg agcccgacaa ggtggaggag gccaacaagg gcgagaacac 2400
cagcctgctg caccccgtga gcctgcacgg catggcagca cccgagcgcg aggtgctgga 2460
gtggcgcttc gacagccgcc tggccttcca ccacgtggcc cgcgagctgc accccgagta 2520
cttcaagaac tgctgaggat ccagatctgc tgtgccttct agttgccagc catctgttgt 2580
ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta 2640
ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg 2700
ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc 2760
ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa 2820
gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc 2880
agccccactc ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa 2940
agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag 3000
agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca 3060
acatgtgagg aagtaatgag agaaatcata gaattttaag gccatcatgg ccttaatctt 3120
ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag 3180
ctcactcaaa ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca 3240
tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 3300
tccataggct ccgccccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 3360
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 3420
ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 3480
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 3540
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgccttа tccggtaact 3600
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 3660
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 3720
actacggcta cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct 3780
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 3840
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 3900
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 3960
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 4020
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 4080
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggg 4140
ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc 4200
catcatccag ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc 4260
agttggtgat tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg 4320
tgatctgatc cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca 4380
agtcagcgta atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc 4440
atcgagcatc aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg 4500
aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag 4560
atcctggtat cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc 4620
ctcgtcaaaa ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga 4680
gaatggcaaa agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc 4740
gtcatcaaaa tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag 4800
acgaaatacg cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg 4860
caggaacact gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac 4920
ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg 4980
gataaaatgc ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat 5040
ctcatctgta acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc 5100
atcgggcttc ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc 5160
ccatttatac ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga 5220

cgtttcccgt tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag 5280
ttttattgtt catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga 5340
cacaacgtgg ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat 5400
gagcggatac atatttgaat gtatttagaa aaataaacaa ataggggttc cgcgcacatt 5460
tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa 5520
aaataggcgt atcacgaggc cctttcgtc 5549

<210> 83
<211> 5549
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 83
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga ccaccatggg 1920
cggcaagtgg agcaagagca gcgtgatcgg ctggcccgcc gtgcgcgagc gcatgcgccg 1980
cgccgagccc gccgccgacg gcgtgggcgc cgtgagccgc gacctggaga agcacggcgc 2040
catcaccagc agcaacaccg ccgccaacaa cgccgcctgc gcctggctgg aggcccagga 2100
ggaggaggag gtgggcttcg cagtgaccgc acaggtggca ctgcgcgcaa tgacctacaa 2160
ggccgccgtg gacctgagcc acttcctgaa ggagaagggc ggcctggagg gcctgatcca 2220

cagccagcgc cgccaggaca tcctggacct gtggatctac cacacccagg gctacttccc 2280
cgactggcag aactacaccc ccggccccgg cgtgcgctac cccctgacct tcggctggtg 2340
ctacaagctg gtgcccgtgg agcccgacaa ggtggaggag gccaacaagg gcgagaacac 2400
cagcctgctg caccccgtga gcctgcacgg catggacgac cccgagcgcg aggtgctgga 2460
gtggcgcttc gacagccgcc tggccttcca ccacgtggcc cgcgagctgc accccgagta 2520
cttcaagaac tgctgaggat ccagatctgc tgtgccttct agttgccagc catctgttgt 2580
ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta 2640
ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg 2700
ggtggggcag gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc 2760
ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa 2820
gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc 2880
agccccactc ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa 2940
agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag 3000
agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca 3060
acatgtgagg aagtaatgag agaaatcata gaattttaag gccatcatgg ccttaatctt 3120
ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag 3180
ctcactcaaa ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca 3240
tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 3300
tccataggct ccgccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 3360
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 3420
ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 3480
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 3540
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact 3600
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 3660
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 3720
actacggcta cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct 3780
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 3840
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 3900
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 3960
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 4020
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 4080
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag 4140
ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc 4200
catcatccag ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc 4260
agttggtgat tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg 4320
tgatctgatc cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca 4380
agtcagcgta atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc 4440
atcgagcatc aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg 4500
aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag 4560
atcctggtat cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc 4620
ctcgtcaaaa ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga 4680
gaatggcaaa agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc 4740
gtcatcaaaa tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag 4800
acgaaatacg cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg 4860
caggaacact gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac 4920
ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg 4980
gataaaatgc ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat 5040
ctcatctgta acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc 5100
atcgggcttc ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc 5160
ccatttatac ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga 5220
cgtttcccgt tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag 5280
ttttattgtt catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga 5340
cacaacgtgg ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat 5400
gagcggatac atatttgaat gtatttagaa aaataaacaa atagggggttc cgcgcacatt 5460
tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa 5520

aaataggcgt atcacgaggc cctttcgtc 5549

<210> 84
<211> 6609
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 84
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gaaggagaag taccagcacc tgtggcgctg gggctggcgc tggggcacca 1980
tgctgctggg catgctgatg atctgcagcg ccaccgagaa gctgtgggtg accgtgtact 2040
acggcgtgcc cgtgtggcgc gaggccacca ccaccctgtt ctgcgccagc gacgccaagg 2100
cctacgacac cgaggtgcac aacgtgtggg ccacccacgc ctgcgtgccc accgacccca 2160
acccccagga ggtggtgctg ggcaacgtga ccgagaactt caacatgtgg aagaacaaca 2220
tggtggacca gatgcacgag gacatcatca gcctgtggga cgagagcctg aagccctgcg 2280
tgaagctgac cccctgtgc gtgaccctga actgcaccaa cctgaacatc accaagaaca 2340
ccaccaacct gaccagcagc agctggggca tgatggagga gggcgagatc aagaactgca 2400
gcttctacat caccaccagc atccgcaaca aggtgaagaa ggagtacgcc ctgttcaacc 2460
gcctggacgt ggtgcccgtg aagaacacca gcaacaccaa gtaccgcctg atcagctgca 2520

acaccagcgt gatcacccag gcctgcccca aggtgagctt ccagcccatc cccatccact 2580
actgcgtgcc cgccggcttc gccatcctga agtgcaacaa caagaccttc aacggcagcg 2640
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 2700
cccagctgct gctgaacggc agcctggccg aggaggacat cgtgatccgc agcgaggact 2760
tcaccgacaa cgtgaagacc atcatcgtgc agctgaacga gagcgtggtg atcaactgca 2820
cccgccccaa caacaacacc cgcgagcgcc tgagcatcgg ccccggccgc gccttctacg 2880
cccgccgcaa catcatcggc gacatccgcc aggcccactg caacatcagc cgcgccaagt 2940
ggaacaacac cctgcagcag atcgtgatca agctgcgcga gaagttccgc aacaagacca 3000
tcgccttcaa ccagagcagc ggcggcgacc ccgagatcgt gatgcacagc ttcaactgcg 3060
gcggcgagtt cttctactgc aacaccgccc agctgttcaa cagcacctgg aacgtggccg 3120
gcggcaccaa cggcaccgag ggcaacgaca tcatcaccct gcagtgccgc atcaagcaga 3180
tcatcaacat gtggcagaag gtgggcaagg ccatgtacgc ccccccccatc accggccaga 3240
tccgctgcag cagcaacatc accggcctgc tgctgacccg cgacggcggc aacagcaccg 3300
agaccgagac cgagatcttc cgccccggcg gcggcgacat gcgcgacaac tggcgcagcg 3360
agctgtacaa gtacaaggtg gtgcgcatcg agcccatcgg cgtggccccc acccgcgcca 3420
agcttaccgt gcaggcccgc ctgctgctga gcggcatcgt gcagcagcag aacaacctgc 3480
tgcgcgccat cgaggcccag cagaacatgc tgcgcctgac cgtgtggggc atcaagcagc 3540
tgcaggcccg cgtgctggcc ctggagcgct acctgcgcga ccagcagctc gagtgaggat 3600
ccagatctgc tgtgccttct agttgccagc catctgttgt ttgccctcc cccgtgcctt 3660
ccttgaccct ggaaggtgcc actcccactg tcctttccta ataaaatgag gaaattgcat 3720
cgcattgtct gagtaggtgt cattctattc tgggggggtgg ggtggggcag gacagcaagg 3780
gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct atgggtaccc 3840
aggtgctgaa gaattgaccc ggttcctcct gggccagaaa gaagcaggca catccccttc 3900
tctgtgacac accctgtcca cgcccctggt tcttagttcc agccccactc ataggacact 3960
catagctcag gagggctccg ccttcaatcc cacccgctaa agtacttgga gcggtctctc 4020
cctccctcat cagcccacca aaccaaacct agcctccaag agtgggaaga aattaaagca 4080
agataggcta ttaagtgcag agggagagaa aatgcctcca acatgtgagg aagtaatgag 4140
agaaatcata gaattttaag gccatcatgg ccttaatctt ccgcttcctc gctcactgac 4200
tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa ggcggtaata 4260
cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa 4320
aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct ccgccccct 4380
gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac aggactataa 4440
agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg 4500
cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc tcatagctca 4560
cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa 4620
ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga gtccaacccg 4680
gtaagacacg acttatcgcc actggcagca gccactggta acaggattag cagagcgagg 4740
tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta cactagaaga 4800
acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag agttggtagc 4860
tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg caagcagcag 4920
attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac ggggtctgac 4980
gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc aaaaaggatc 5040
ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag tatatatgag 5100
taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc agcgatctgt 5160
ctatttcgtt catccatagt tgcctgactc ggggggggggg ggcgctgagg tctgcctcgt 5220
gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag ccagaaagtg 5280
agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat tttgaacttt 5340
tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca 5400
gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta atgctctgcc 5460
agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc aaatgaaact 5520
gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt ttctgtaatg 5580
aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat cggtctgcga 5640
ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa ataaggttat 5700
caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa agcttatgca 5760
tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa tcactcgcat 5820

caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt 5880
taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact gccagcgcat 5940
caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct gttttcccgg 6000
ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc ttgatggtcg 6060
gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta acatcattgg 6120
caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc ccatacaatc 6180
gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac ccatataaat 6240
cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc 6300
tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt catgatgata 6360
tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg ctttcccccc 6420
ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac atatttgaat 6480
gtatttagaa aaataaacaa atagggggttc cgcgcacatt tccccgaaaa gtgccacctg 6540
acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt atcacgaggc 6600
cctttcgtc 6609

<210> 85
<211> 6783
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 85
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc catttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gaaggagaag taccagcacc tgtggcgctg gggctggcgc tggggcacca 1980
tgctgctggg catgctgatg atctgcagcg ccaccgagaa gctgtgggtg accgtgtact 2040
acggcgtgcc cgtgtggcgc gaggccacca ccaccctgtt ctgcgccagc gacgccaagg 2100
cctacgacac cgaggtgcac aacgtgtggg ccacccacgc ctgcgtgccc accgacccca 2160
acccccagga ggtggtgctg ggcaacgtga ccgagaactt caacatgtgg aagaacaaca 2220
tggtggacca gatgcacgag gacatcatca gcctgtggga cgagagcctg aagccctgcg 2280
tgaagctgac ccccctgtgc gtgaccctga actgcaccaa cctgaacatc accaagaaca 2340
ccaccaacct gaccagcagc agctggggca tgatggagga gggcgagatc aagaactgca 2400
gcttctacat caccaccagc atccgcaaca aggtgaagaa ggagtacgcc ctgttcaacc 2460
gcctggacgt ggtgcccgtg aagaacacca gcaacaccaa gtaccgcctg atcagctgca 2520
acaccagcgt gatcacccag gcctgcccca aggtgagctt ccagcccatc cccatccact 2580
actgcgtgcc cgccggcttc gccatcctga agtgcaacaa caagaccttc aacggcagcg 2640
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 2700
cccagctgct gctgaacggc agcctggccg aggaggacat cgtgatccgc agcgaggact 2760
tcaccgacaa cgtgaagacc atcatcgtgc agctgaacga gagcgtggtg atcaactgca 2820
cccgccccaa caacaacacc cgcgagcgcc tgagcatcgg ccccggccgc gccttctacg 2880
cccgccgcaa catcatcggc gacatccgcc aggcccactg caacatcagc cgcgccaagt 2940
ggaacaacac cctgcagcag atcgtgatca agctgcgcga gaagttccgc aacaagacca 3000
tcgccttcaa ccagagcagc ggcggcgacc ccgagatcgt gatgcacagc ttcaactgcg 3060
gcggcgagtt cttctactgc aacaccgccc agctgttcaa cagcacctgg aacgtggccg 3120
gcggcaccaa cggcaccgag ggcaacgaca tcatcaccct gcagtgccgc atcaagcaga 3180
tcatcaacat gtggcagaag gtgggcaagg ccatgtacgc ccccccccatc accggccaga 3240
tccgctgcag cagcaacatc accggcctgc tgctgacccg cgacggcggc aacagcaccg 3300
agaccgagac cgagatcttc cgccccggcg gcggcgacat gcgcgacaac tggcgcagcg 3360
agctgtacaa gtacaaggtg gtgcgcatcg agcccatcgg cgtggccccc acccgcgcca 3420
agcttaccgt gcaggcccgc ctgctgctga gcggcatcgt gcagcagcag aacaacctgc 3480
tgcgcgccat cgaggcccag cagaacatgc tgcgcctgac cgtgtggggc atcaagcagc 3540
tgcaggcccg cgtgctggcc ctggagcgct acctgcgcga ccagcagctc gaggacatct 3600
ggaacaacat gacctggatg gagtgggagc gcgagatcga caactacacc gactacatct 3660
acgacctgct ggagaagagc cagacccagc aggagaagaa cgagaaggag ctgctggagc 3720
tggacaagtg ggccagcctg tggaactggt tcgacatcac caactggtga ggatccagat 3780
ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctccccccgtg ccttccttga 3840
ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 3900
gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc aaggggggagg 3960
attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt acccaggtgc 4020
tgaagaattg acccggttcc tcctgggcca gaaagaagca ggcacatccc cttctctgtg 4080
acacaccctg tccacgcccc tggttcttag ttccagcccc actcatagga cactcatagc 4140
tcaggagggc tccgccttca atcccacccg ctaaagtact tggagcggtc tctccctccc 4200
tcatcagccc accaaaccaa acctagcctc caagagtggg aagaaattaa agcaagatag 4260
gctattaagt gcagagggag agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat 4320
catagaattt taaggccatc atggccttaa tcttccgctt cctcgctcac tgactcgctg 4380
cgctcggtcg ttcggctgcg gcgagcggta tcagctcact caaaggcggt aatacggtta 4440
tccacagaat caggggataa cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc 4500
aggaaccgta aaaaggccgc gttgctggcg tttttccata ggctccgccc ccctgacgag 4560
catcacaaaa atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac 4620
caggcgtttc cccctggaag ctccctcgtg cgctctcctg ttccgaccct gccgcttacc 4680
ggatacctgt ccgcctttct cccttcggga agcgtggcgc tttctcatag ctcacgctgt 4740
aggtatctca gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc 4800
gttcagcccg accgctgcgc cttatccggt aactatcgtc ttgagtccaa cccggtaaga 4860
cacgacttat cgccactggc agcagccact ggtaacagga ttagcagagc gaggtatgta 4920
ggcggtgcta cagagttctt gaagtggtgg cctaactacg gctacactag aagaacagta 4980
tttggtatct gcgctctgct gaagccagtt accttcggaa aaagagttgg tagctcttga 5040

tccggcaaac aaaccaccgc tggtagcggt ggtttttttg tttgcaagca gcagattacg 5100
cgcagaaaaa aaggatctca agaagatcct ttgatctttt ctacggggtc tgacgctcag 5160
tggaacgaaa actcacgtta agggattttg gtcatgagat tatcaaaaag gatcttcacc 5220
tagatccttt taaattaaaa atgaagtttt aaatcaatct aaagtatata tgagtaaact 5280
tggtctgaca gttaccaatg cttaatcagt gaggcaccta tctcagcgat ctgtctattt 5340
cgttcatcca tagttgcctg actcgggggg ggggggcgct gaggtctgcc tcgtgaagaa 5400
ggtgttgctg actcatacca ggcctgaatc gccccatcat ccagccagaa agtgagggag 5460
ccacggttga tgagagcttt gttgtaggtg gaccagttgg tgattttgaa cttttgcttt 5520
gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa ctcagcaaaa 5580
gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc tgccagtgtt 5640
acaaccaatt aaccaattct gattagaaaa actcatcgag catcaaatga aactgcaatt 5700
tattcatatc aggattatca ataccatatt tttgaaaaag ccgtttctgt aatgaaggag 5760
aaaactcacc gaggcagttc cataggatgg caagatcctg gtatcggtct gcgattccga 5820
ctcgtccaac atcaatacaa cctattaatt tcccctcgtc aaaaataagg ttatcaagtg 5880
agaaatcacc atgagtgacg actgaatccg gtgagaatgg caaaagctta tgcatttctt 5940
tccagacttg ttcaacaggc agccattac gctcgtcatc aaaatcactc gcatcaacca 6000
aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg ctgttaaaag 6060
gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc gcatcaacaa 6120
tattttcacc tgaatcagga tattcttcta atacctggaa tgctgttttc ccggggatcg 6180
cagtggtgag taaccatgca tcatcaggag tacggataaa atgcttgatg gtcggaagag 6240
gcataaaattc cgtcagccag tttagtctga ccatctcatc tgtaacatca ttggcaacgc 6300
tacctttgcc atgtttcaga aacaactctg gcgcatcggg cttcccatac aatcgataga 6360
ttgtcgcacc tgattgcccg acattatcgc gagcccattt atacccatat aaatcagcat 6420
ccatgttgga atttaatcgc ggcctcgagc aagacgtttc ccgttgaata tggctcataa 6480
caccccttgt attactgttt atgtaagcag acagttttat tgttcatgat gatatatttt 6540
tatcttgtgc aatgtaacat cagagatttt gagacacaac gtggctttcc ccccccccc 6600
attattgaag catttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt 6660
agaaaaataa acaaataggg gttccgcgca catttccccg aaaagtgcca cctgacgtct 6720
aagaaaccat tattatcatg acattaacct ataaaaatag gcgtatcacg aggccctttc 6780
gtc 6783

<210> 86
<211> 6861
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 86
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780

cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gaaggagaag taccagcacc tgtggcgctg gggctggcgc tggggcacca 1980
tgctgctggg catgctgatg atctgcagcg ccaccgagaa gctgtgggtg accgtgtact 2040
acggcgtgcc cgtgtggcgc gaggccacca ccaccctgtt ctgcgccagc gacgccaagg 2100
cctacgacac cgaggtgcac aacgtgtggg ccacccacgc ctgcgtgccc accgacccca 2160
acccccagga ggtggtgctg ggcaacgtga ccgagaactt caacatgtgg aagaacaaca 2220
tggtggacca gatgcacgag gacatcatca gcctgtggga cgagagcctg aagccctgcg 2280
tgaagctgac ccccctgtgc gtgaccctga actgcaccaa cctgaacatc accaagaaca 2340
ccaccaacct gaccagcagc agctggggca tgatggagga gggcgagatc aagaactgca 2400
gcttctacat caccaccagc atccgcaaca aggtgaagaa ggagtacgcc ctgttcaacc 2460
gcctggacgt ggtgcccgtg aagaacacca gcaacaccaa gtaccgcctg atcagctgca 2520
acaccagcgt gatcacccag gcctgcccca aggtgagctt ccagcccatc cccatccact 2580
actgcgtgcc cgccggcttc gccatcctga agtgcaacaa caagaccttc aacggcagcg 2640
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 2700
cccagctgct gctgaacggc agcctggccg aggaggacat cgtgatccgc agcgaggact 2760
tcaccgacaa cgtgaagacc atcatcgtgc agctgaacga gagcgtggtg atcaactgca 2820
cccgccccaa caacaacacc cgcgagcgcc tgagcatcgg ccccggccgc gccttctacg 2880
cccgccgcaa catcatcggc gacatccgcc aggcccactg caacatcagc cgcgccaagt 2940
ggaacaacac cctgcagcag atcgtgatca agctgcgcga gaagttccgc aacaagacca 3000
tcgccttcaa ccagagcagc ggcggcgacc ccgagatcgt gatgcacagc ttcaactgcg 3060
gcggcgagtt cttctactgc aacaccgccc agctgttcaa cagcacctgg aacgtggccg 3120
gcggcaccaa cggcaccgag ggcaacgaca tcatcaccct gcagtgccgc atcaagcaga 3180
tcatcaacat gtggcagaag gtgggcaagg ccatgtacgc ccccccccatc accggccaga 3240
tccgctgcag cagcaacatc accggcctgc tgctgacccg cgacggcggc aacagcaccg 3300
agaccgagac cgagatcttc cgccccggcg gcggcgacat gcgcgacaac tggcgcagcg 3360
agctgtacaa gtacaaggtg gtgcgcatcg agcccatcgg cgtggccccc acccgcgcca 3420
agcttaccgt gcaggcccgc ctgctgctga gcggcatcgt gcagcagcag aacaacctgc 3480
tgcgcgccat cgaggcccag cagaacatgc tgcgcctgac cgtgtggggc atcaagcagc 3540
tgcaggcccg cgtgctggcc ctggagcgct acctgcgcga ccagcagctc gaggacatct 3600
ggaacaacat gacctggatg gagtgggagc gcgagatcga caactacacc gactacatct 3660
acgacctgct ggagaagagc cagacccagc aggagaagaa cgagaaggag ctgctggagc 3720
tggacaagtg ggccagcctg tggaactggt tcgacatcac caactggctg tggtacatcc 3780
gcctgttcat catgatcgtg ggcggcctga tcggcctgcg catcgtgttc gccgtgctga 3840
gcatctgagg atccagatct gctgtgcctt ctagttgcca gccatctgtt gtttgccct 3900
ccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc taataaaatg 3960
aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggt ggggtgggc 4020
aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat gcggtgggct 4080

ctatgggtac ccaggtgctg aagaattgac ccggttcctc ctgggccaga aagaagcagg 4140
cacatcccct tctctgtgac acaccctgtc cacgcccctg gttcttagtt ccagccccac 4200
tcataggaca ctcatagctc aggagggctc cgccttcaat cccacccgct aaagtacttg 4260
gagcggtctc tccctccctc atcagcccac caaaccaaac ctagcctcca agagtgggaa 4320
gaaattaaag caagataggc tattaagtgc agagggagag aaaatgcctc caacatgtga 4380
ggaagtaatg agagaaatca tagaatttta aggccatcat ggccttaatc ttccgcttcc 4440
tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc gagcggtatc agctcactca 4500
aaggcggtaa tacggttatc cacagaatca ggggataacg caggaaagaa catgtgagca 4560
aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt tttccatagg 4620
ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa gtcagaggtg gcgaaacccg 4680
acaggactat aaagatacca ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt 4740
ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc cttcgggaag cgtggcgctt 4800
tctcatagct cacgctgtag gtatctcagt tcggtgtagg tcgttcgctc caagctgggc 4860
tgtgtgcacg aaccccccgt tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt 4920
gagtccaacc cggtaagaca cgacttatcg ccactggcag cagccactgg taacaggatt 4980
agcagagcga ggtatgtagg cggtgctaca gagttcttga agtggtggcc taactacggc 5040
tacactagaa gaacagtatt tggtatctgc gctctgctga agccagttac cttcggaaaa 5100
agagttggta gctcttgatc cggcaaacaa accaccgctg gtagcggtgg ttttttgtt 5160
tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag aagatccttt gatcttttct 5220
acggggtctg acgctcagtg gaacgaaaac tcacgttaag ggattttggt catgagatta 5280
tcaaaaagga tcttcaccta gatcctttta aattaaaaat gaagttttaa atcaatctaa 5340
agtatatatg agtaaacttg gtctgacagt taccaatgct taatcagtga ggcacctatc 5400
tcagcgatct gtctatttcg ttcatccata gttgcctgac tcgggggggg ggggcgctga 5460
ggtctgcctc gtgaagaagg tgttgctgac tcataccagg cctgaatcgc cccatcatcc 5520
agccagaaag tgagggagcc acggttgatg agagctttgt tgtaggtgga ccagttggtg 5580
attttgaact tttgctttgc cacggaacgg tctgcgttgt cgggaagatg cgtgatctga 5640
tccttcaact cagcaaaagt tcgatttatt caacaaagcc gccgtcccgt caagtcagcg 5700
taatgctctg ccagtgttac aaccaattaa ccaattctga ttagaaaaac tcatcgagca 5760
tcaaatgaaa ctgcaattta ttcatatcag gattatcaat accatatttt tgaaaaagcc 5820
gtttctgtaa tgaaggagaa aactcaccga ggcagttcca taggatggca agatcctggt 5880
atcggtctgc gattccgact cgtccaacat caatacaacc tattaatttc ccctcgtcaa 5940
aaataaggtt atcaagtgag aaatcaccat gagtgacgac tgaatccggt gagaatggca 6000
aaagcttatg catttctttc cagacttgtt caacaggcca gccattacgc tcgtcatcaa 6060
aatcactcgc atcaaccaaa ccgttattca ttcgtgattg cgcctgagcg agacgaaata 6120
cgcgatcgct gttaaaagga caattacaaa caggaatcga atgcaaccgg cgcaggaaca 6180
ctgccagcgc atcaacaata ttttcacctg aatcaggata ttcttctaat acctggaatg 6240
ctgttttccc ggggatcgca gtggtgagta accatgcatc atcaggagta cggataaaat 6300
gcttgatggt cggaagaggc ataaattccg tcagccagtt tagtctgacc atctcatctg 6360
taacatcatt ggcaacgcta cctttgccat gtttcagaaa caactctggc gcatcgggct 6420
tcccatacaa tcgatagatt gtcgcacctg attgcccgac attatcgcga gcccatttat 6480
acccatataa atcagcatcc atgttggaat ttaatcgcgg cctcgagcaa gacgtttccc 6540
gttgaatatg gctcataaca ccccttgtat tactgtttat gtaagcagac agttttattg 6600
ttcatgatga tatattttta tcttgtgcaa tgtaacatca gagattttga gacacaacgt 6660
ggctttcccc ccccccccat tattgaagca tttatcaggg ttattgtctc atgagcggat 6720
acatatttga atgtatttag aaaaataaac aaataggggt tccgcgcaca tttccccgaa 6780
aagtgccacc tgacgtctaa gaaaccatta ttatcatgac attaacctat aaaaataggc 6840
gtatcacgag gccctttcgt c 6861

<210> 87
<211> 7552
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 87
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt ccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gaaggagaag taccagcacc tgtggcgctg gggctggcgc tggggcacca 1980
tgctgctggg catgctgatg atctgcagcg ccaccgagaa gctgtgggtg accgtgtact 2040
acggcgtgcc cgtgtggcgc gaggccacca ccaccctgtt ctgcgccagc gacgccaagg 2100
cctacgacac cgaggtgcac aacgtgtggg ccacccacgc ctgcgtgccc accgacccca 2160
acccccagga ggtggtgctg ggcaacgtga ccgagaactt caacatgtgg aagaacaaca 2220
tggtggacca gatgcacgag gacatcatca gcctgtggga cgagagcctg aagccctgcg 2280
tgaagctgac ccccctgtgc gtgaccctga actgcaccaa cctgaacatc accaagaaca 2340
ccaccaacct gaccagcagc agctggggca tgatggagga gggcgagatc aagaactgca 2400
gcttctacat caccaccagc atccgcaaca aggtgaagaa ggagtacgcc ctgttcaacc 2460
gcctggacgt ggtgcccgtg aagaacacca gcaacaccaa gtaccgcctg atcagctgca 2520
acaccagcgt gatcacccag gcctgcccca aggtgagctt ccagcccatc cccatccact 2580
actgcgtgcc cgccggcttc gccatcctga agtgcaacaa caagaccttc aacggcagcg 2640
gcccctgcac caacgtgagc accgtgcagt gcacccacgg catccgcccc gtggtgagca 2700
cccagctgct gctgaacggc agcctggccg aggaggacat cgtgatccgc agcgaggact 2760
tcaccgacaa cgtgaagacc atcatcgtgc agctgaacga gagcgtggtg atcaactgca 2820
cccgccccaa caacaacacc cgcgagcgcc tgagcatcgg ccccggccgc gccttctacg 2880
cccgccgcaa catcatcggc gacatccgcc aggcccactg caacatcagc cgcgccaagt 2940
ggaacaacac cctgcagcag atcgtgatca agctgcgcga gaagttccgc aacaagacca 3000
tcgccttcaa ccagagcagc ggcggcgacc ccgagatcgt gatgcacagc ttcaactgcg 3060

gcggcgagtt cttctactgc aacaccgccc agctgttcaa cagcacctgg aacgtggccg 3120
gcggcaccaa cggcaccgag ggcaacgaca tcatcaccct gcagtgccgc atcaagcaga 3180
tcatcaacat gtggcagaag gtgggcaagg ccatgtacgc ccccccccatc accggccaga 3240
tccgctgcag cagcaacatc accggcctgc tgctgacccg cgacggcggc aacagcaccg 3300
agaccgagac cgagatcttc cgccccggcg gcggcgacat gcgcgacaac tggcgcagcg 3360
agctgtacaa gtacaaggtg gtgcgcatcg agcccatcgg cgtggccccc acccgcgcca 3420
agcgccgcac cgtgcagcgc gagaagcgcg ccgtgggcat cggcgccgtg ttcctgggct 3480
tcctgggcgc cgccggcagc accatgggcg ccgccagcgt gaccctgacc gtgcaggccc 3540
gcctgctgct gagcggcatc gtgcagcagc agaacaacct gctgcgcgcc atcgaggccc 3600
agcagaacat gctgcgcctg accgtgtggg gcatcaagca gctgcaggcc cgcgtgctgg 3660
ccctggagcg ctacctgcgc gaccagcagc tgatgggcat ctggggctgc agcggcaagc 3720
ttatctgcac caccagcgtg ccctggaacg tgagctggag caacaagagc gtggacgaca 3780
tctggaacaa catgacctgg atggagtggg agcgcgagat cgacaactac accgactaca 3840
tctacgacct gctggagaag agccagaccc agcaggagaa gaacgagaag gagctgctgg 3900
agctggacaa gtgggccagc ctgtggaact ggttcgacat caccaactgg ctgtggtaca 3960
tccgcctgtt catcatgatc gtgggcggcc tgatcggcct gcgcatcgtg ttcgccgtgc 4020
tgagcatcgt gaaccgcgtg cgccagggct acagcccccc gagcttccag accctgctgc 4080
ccgccagccg cggccccgac cgccccgagg gcaccgagga ggagggcggc gagcgcgacc 4140
gcgaccgcag cggccccagc gtgaacggca gcctggccct gatctgggac gacctgcgca 4200
gcctgtgcct gttcagctac caccgcctgc gcgacctgct gctgatcgtg acccgcatcg 4260
tggagctgct gggccgccgc ggctgggagg ccctgaagta ctggtggaac ctgctgcagt 4320
actggagcca ggagctgaag aacagcgccg tgagcctgct gcagtacggc tggagctact 4380
tccacgaggc cgtgcaggcc gtgtggcgca gcgccaccga gaccctggcc ggcgcctggg 4440
gcgacctgtg ggagaccctg cgccgcggcg gccgctggat cttggccatc ccccgccgca 4500
tccgccaggg cctggagctg accctgctgt gaacacgtgg gatccagatc tgctgtgcct 4560
tctagttgcc agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt 4620
gccactccca ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg 4680
tgtcattcta ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac 4740
aatagcaggc atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga 4800
cccggttcct cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt 4860
ccacgccccc ggttcttagt tccagcccca ctcataggac actcatagct caggagggct 4920
ccgccttcaa tcccacccgc taaagtactt ggagcggtct ctccctccct catcagccca 4980
ccaaaccaaa cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg 5040
cagagggaga gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt 5100
aaggccatca tggccttaat cttccgcttc ctcgctcact gactcgctgc gctcggtcgt 5160
tcggctgcgg cgagcggtat cagctcactc aaaggcggta atacggttat ccacagaatc 5220
aggggataac gcaggaaaga acatgtgagc aaaaggccag caaaaggcca ggaaccgtaa 5280
aaaggccgcg ttgctggcgt ttttccatag gctccgcccc cctgacgagc atcacaaaaa 5340
tcgacgctca agtcagaggt ggcgaaaccc gacaggacta taaagatacc aggcgtttcc 5400
ccctggaagc tccctcgtgc gctctcctgt tccgaccctg ccgcttaccg gatacctgtc 5460
cgcctttctc ccttcgggaa gcgtggcgct ttctcatagc tcacgctgta ggtatctcag 5520
ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac gaacccccccg ttcagcccga 5580
ccgctgcgcc ttatccggta actatcgtct tgagtccaac ccggtaagac acgacttatc 5640
gccactggca gcagccactg gtaacaggat tagcagagcg aggtatgtag gcggtgctac 5700
agagttcttg aagtggtggc ctaactacgg ctacactaga agaacagtat ttggtatctg 5760
cgctctgctg aagccagtta ccttcggaaa aagagttggt agctcttgat ccggcaaaca 5820
aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag cagattacgc gcagaaaaaa 5880
aggatctcaa gaagatcctt tgatcttttc tacggggtct gacgctcagt ggaacgaaaa 5940
ctcacgttaa gggattttgg tcatgagatt atcaaaaagg atcttcacct agatcctttt 6000
aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaactt ggtctgacag 6060
ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc tgtctatttc gttcatccat 6120
agttgcctga ctcgggggggg gggggcgctg aggtctgcct cgtgaagaag gtgttgctga 6180
ctcataccag gcctgaatcg ccccatcatc cagccagaaa gtgagggagc cacggttgat 6240
gagagctttg ttgtaggtgg accagttggt gattttgaac ttttgctttg ccacggaacg 6300
gtctgcgttg tcgggaagat gcgtgatctg atccttcaac tcagcaaaag ttcgatttat 6360

tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct gccagtgtta caaccaatta 6420
accaattctg attagaaaaa ctcatcgagc atcaaatgaa actgcaattt attcatatca 6480
ggattatcaa taccatattt ttgaaaaagc cgtttctgta atgaaggaga aaactcaccg 6540
aggcagttcc ataggatggc aagatcctgg tatcggtctg cgattccgac tcgtccaaca 6600
tcaatacaac ctattaattt cccctcgtca aaaataaggt tatcaagtga gaaatcacca 6660
tgagtgacga ctgaatccgg tgagaatggc aaaagcttat gcatttcttt ccagacttgt 6720
tcaacaggcc agccattacg ctcgtcatca aaatcactcg catcaaccaa accgttattc 6780
attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc tgttaaaagg acaattacaa 6840
acaggaatcg aatgcaaccg gcgcaggaac actgccagcg catcaacaat attttcacct 6900
gaatcaggat attcttctaa tacctggaat gctgttttcc cggggatcgc agtggtgagt 6960
aaccatgcat catcaggagt acggataaaa tgcttgatgg tcggaagagg cataaattcc 7020
gtcagccagt ttagtctgac catctcatct gtaacatcat tggcaacgct acctttgcca 7080
tgtttcagaa acaactctgg cgcatcgggc ttcccatata atcgatagat tgtcgcacct 7140
gattgcccga cattatcgcg agcccattta tacccatata aatcagcatc catgttggaa 7200
tttaatcgcg gcctcgagca agacgtttcc cgttgaatat ggctcataac acccccttgta 7260
ttactgttta tgtaagcaga cagttttatt gttcatgatg atatattttt atcttgtgca 7320
atgtaacatc agagattttg agacacaacg tggctttccc cccccccca ttattgaagc 7380
atttatcagg gttattgtct catgagcgga tacatatttg aatgtattta gaaaaataaa 7440
caaatagggg ttccgcgcac atttccccga aaagtgccac ctgacgtcta agaaaccatt 7500
attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg tc 7552

<210> 88
<211> 6774
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 88
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380

cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gcccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2820
acacccgcaa gagcatccgc atcggccccg gccaggcctt ctacgccacc ggcgagatca 2880
tcggcgacat ccgccaggcc cactgcaaca tcagccgcac cgcctggaac aagaccctgc 2940
aggaggtggg caagaagctg gccgagcact tccccaacaa ggccatcaag ttcgccaagc 3000
acagcggcgg cgacctggag atcaccaccc acagcttcaa ctgccgcggc gagttcttct 3060
actgcaacac cagcagcctg ttcaacagca cctacacccc caacagcacc gagaacatca 3120
ccggcaccga gaacagcatc atcaccatcc cctgccgcat caagcagatc atcaacatgt 3180
ggcagggcgt gggccgcgcc atgtacgccc cccccatcga gggcatcctg acctgccgca 3240
gcaacatcac cggcctgctg ctgacccgcg acggcggcac cggcatgcac gacaccgaga 3300
tcttccgcct gggcggcggc gacatgcgcg acaactggcg cagcgagctg tacaagtaca 3360
aggtggtgaa gatcgagccc ctgggcgtgg cccccaccaa ggccaagctt accgtgcagg 3420
cccgccagct gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg 3480
cccagcagca cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc 3540
tggccgtgga gcgctacctg aaggaccagc agctggagca gatctggaac cacaccacct 3600
ggatggagtg ggaccgcgag atcaacaact acaccagcct gatccacagc ctgatcgagg 3660
agagccagaa ccagcaggag aagaacgagc aggagctgct ggagctggac aagtgggcca 3720
gcctgtggaa ctggttcaac atcaccaact ggctgtggtg aggatccaga tctgctgtgc 3780
cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg accctggaag 3840
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat tgtctgagta 3900
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag gattgggaag 3960
acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg ctgaagaatt 4020
gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt gacacaccct 4080
gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag ctcaggaggg 4140
ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc ctcatcagcc 4200
caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata ggctattaag 4260
tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa tcatagaatt 4320
ttaaggccat catggcctta atcttccgct tcctcgctca ctgactcgct gcgctcggtc 4380
gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg taatacggtt atccacagaa 4440
tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc caggaaccgt 4500
aaaaaggccg cgttgctggc gtttttccat aggctccgcc cccctgacga gcatcacaaa 4560
aatcgacgct caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt 4620
cccccctggaa gctccctcgt gcgctctcct gttccgaccc tgccgcttac cggatacctg 4680

tccgcctttc tcccttcggg aagcgtggcg ctttctcata gctcacgctg taggtatctc 4740
agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc 4800
gaccgctgcg ccttatccgg taactatcgt cttgagtcca acccggtaag acacgactta 4860
tcgccactgg cagcagccac tggtaacagg attagcagag cgaggtatgt aggcggtgct 4920
acagagttct tgaagtggtg gcctaactac ggctacacta gaagaacagt atttggtatc 4980
tgcgctctgc tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa 5040
caaaccaccg ctggtagcgg tggtttttt gtttgcaagc agcagattac gcgcagaaaa 5100
aaaggatctc aagaagatcc tttgatcttt tctacggggt ctgacgctca gtggaacgaa 5160
aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac ctagatcctt 5220
ttaaattaaa aatgaagttt taaatcaatc taaagtatat atgagtaaac ttggtctgac 5280
agttaccaat gcttaatcag tgaggcacct atctcagcga tctgtctatt tcgttcatcc 5340
atagttgcct gactcggggg gggggggcgc tgaggtctgc ctcgtgaaga aggtgttgct 5400
gactcatacc aggcctgaat cgccccatca tccagccaga aagtgaggga gccacggttg 5460
atgagagctt tgttgtaggt ggaccagttg gtgattttga acttttgctt tgccacggaa 5520
cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca actcagcaaa agttcgattt 5580
attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct ctgccagtgt tacaaccaat 5640
taaccaattc tgattagaaa aactcatcga gcatcaaatg aaactgcaat ttattcatat 5700
caggattatc aataccatat ttttgaaaaa gccgtttctg taatgaagga gaaaactcac 5760
cgaggcagtt ccataggatg gcaagatcct ggtatcggtc tgcgattccg actcgtccaa 5820
catcaataca acctattaat ttcccctcgt caaaaataag gttatcaagt gagaaatcac 5880
catgagtgac gactgaatcc ggtgagaatg gcaaaagctt atgcatttct ttccagactt 5940
gttcaacagg ccagccatta cgctcgtcat caaaatcact cgcatcaacc aaaccgttat 6000
tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc gctgttaaaa ggacaattac 6060
aaacaggaat cgaatgcaac cggcgcagga acactgccag cgcatcaaca atattttcac 6120
ctgaatcagg atattcttct aatacctgga atgctgtttt cccggggatc gcagtggtga 6180
gtaaccatgc atcatcagga gtacggataa aatgcttgat ggtcggaaga ggcataaatt 6240
ccgtcagcca gtttagtctg accatctcat ctgtaacatc attggcaacg ctacctttgc 6300
catgtttcag aaacaactct ggcgcatcgg gcttcccata caatcgatag attgtcgcac 6360
ctgattgccc gacattatcg cgagcccatt tatacccata taaatcagca tccatgttgg 6420
aatttaatcg cggcctcgag caagacgttt cccgttgaat atggctcata acaccccttg 6480
tattactgtt tatgtaagca gacagtttta ttgttcatga tgatatattt ttatcttgtg 6540
caatgtaaca tcagagattt tgagacacaa cgtggctttc ccccccccc cattattgaa 6600
gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata 6660
aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc taagaaacca 6720
ttattatcat gacattaacc tataaaaata ggcgtatcac gaggcccttt cgtc 6774

<210> 89
<211> 6846
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 89
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480

catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2820
acacccgcaa gagcatccgc atcggccccg gccaggcctt ctacgccacc ggcgagatca 2880
tcggcgacat ccgccaggcc cactgcaaca tcagccgcac cgcctggaac aagaccctgc 2940
aggaggtggg caagaagctg gccgagcact tccccaacaa ggccatcaag ttcgccaagc 3000
acagcggcgg cgacctggag atcaccaccc acagcttcaa ctgccgcggc gagttcttct 3060
actgcaacac cagcagcctg ttcaacagca cctacacccc caacagcacc gagaacatca 3120
ccggcaccga gaacagcatc atcaccatcc cctgccgcat caagcagatc atcaacatgt 3180
ggcagggcgt gggccgcgcc atgtacgccc cccccatcga gggcatcctg acctgccgca 3240
gcaacatcac cggcctgctg ctgacccgcg acggcggcac cggcatgcac gacaccgaga 3300
tcttccgcct gggcggcggc gacatgcgcg acaactggcg cagcgagctg tacaagtaca 3360
aggtggtgaa gatcgagccc ctgggcgtgg cccccaccaa ggccaagctt accgtgcagg 3420
cccgccagct gctgagcggc atcgtgcagc agcagaacaa cctgctgcgc gccatcgagg 3480
cccagcagca cctgctgcag ctgaccgtgt ggggcatcaa gcagctgcag gcccgcatcc 3540
tggccgtgga gcgctacctg aaggaccagc agctggagca gatctggaac cacaccacct 3600
ggatggagtg ggaccgcgag atcaacaact acaccagcct gatccacagc ctgatcgagg 3660
agagccagaa ccagcaggag aagaacgagc aggagctgct ggagctggac aagtgggcca 3720
gcctgtggaa ctggttcaac atcaccaact ggctgtggta catcaagctg ttcatcatga 3780

tcgtgggcgg cctggtgggc ctgcgcatcg tgttcgccgt gctgagcatc tgaggatcca 3840
gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 3900
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3960
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 4020
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 4080
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 4140
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 4200
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 4260
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 4320
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4380
aatcatagaa ttttaaggcc atcatggcct taatcttccg cttcctcgct cactgactcg 4440
ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg 4500
ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg ccagcaaaag 4560
gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg cccccctgac 4620
gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg actataaaga 4680
taccaggcgt ttcccccctgg aagctccctc gtgcgctctc ctgttccgac cctgccgctt 4740
accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca tagctcacgc 4800
tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc 4860
cccgttcagc ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc caacccggta 4920
agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag agcgaggtat 4980
gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac tagaagaaca 5040
gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaaagagt tggtagctct 5100
tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt 5160
acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg gtctgacgct 5220
cagtggaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa aaggatcttc 5280
acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa 5340
acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc gatctgtcta 5400
tttcgttcat ccatagttgc ctgactcggg gggggggggc gctgaggtct gcctcgtgaa 5460
gaaggtgttg ctgactcata ccaggcctga atcgccccat catccagcca gaaagtgagg 5520
gagccacggt tgatgagagc tttgttgtag gtggaccagt tggtgatttt gaacttttgc 5580
tttgccacgg aacggtctgc gttgtcggga agatgcgtga tctgatcctt caactcagca 5640
aaagttcgat ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt 5700
gttacaacca attaaccaat tctgattaga aaaactcatc gagcatcaaa tgaaactgca 5760
atttattcat atcaggatta tcaataccat atttttgaaa aagccgtttc tgtaatgaag 5820
gagaaaactc accgaggcag ttccatagga tggcaagatc ctggtatcgg tctgcgattc 5880
cgactcgtcc aacatcaata caacctatta atttcccctc gtcaaaaata aggttatcaa 5940
gtgagaaatc accatgagtg acgactgaat ccggtgagaa tggcaaaagc ttatgcattt 6000
ctttccagac ttgttcaaca ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa 6060
ccaaaccgtt attcattcgt gattgcgcct gagcgagacg aaatacgcga tcgctgttaa 6120
aaggacaatt acaaacagga atcgaatgca accggcgcag gaacactgcc agcgcatcaa 6180
caatatttc acctgaatca ggatattctt ctaatacctg gaatgctgtt ttcccgggga 6240
tcgcagtggt gagtaaccat gcatcatcag gagtacggat aaaatgcttg atggtcggaa 6300
gaggcataaa ttccgtcagc cagtttagtc tgaccatctc atctgtaaca tcattggcaa 6360
cgctaccttt gccatgtttc agaaacaact ctggcgcatc gggcttccca tacaatcgat 6420
agattgtcgc acctgattgc ccgacattat cgcgagccca tttataccca tataaatcag 6480
catccatgtt ggaatttaat cgcggcctcg agcaagacgt ttcccgttga atatggctca 6540
taacacccct tgtattactg tttatgtaag cagacagttt tattgttcat gatgatatat 6600
ttttatcttg tgcaatgtaa catcagagat tttgagacac aacgtggctt tcccccccccc 6660
cccattattg aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta 6720
tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg 6780
tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct 6840
ttcgtc 6846

<210> 90
<211> 6853
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 90
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760

agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2820
acacccgcaa gagcatccgc atcggccccg gccaggcctt ctacgccacc ggcgagatca 2880
tcggcgacat ccgccaggcc cactgcaaca tcagccgcac cgcctggaac aagaccctgc 2940
aggaggtggg caagaagctg gccgagcact tccccaacaa ggccatcaag ttcgccaagc 3000
acagcggcgg cgacctggag atcaccaccc acagcttcaa ctgccgcggc gagttcttct 3060
actgcaacac cagcagcctg ttcaacagca cctacacccc caacagcacc gagaacatca 3120
ccggcaccga gaacagcatc atcaccatcc cctgccgcat caagcagatc atcaacatgt 3180
ggcagggcgt gggccgcgcc atgtacgccc cccccatcga gggcatcctg acctgccgca 3240
gcaacatcac cggcctgctg ctgacccgcg acggcggcac cggcatgcac gacaccgaga 3300
tcttccgccc cgagggcggc gacatgcgcg acaactggcg cagcgagctg tacaagtaca 3360
aggtggtgga gatcaagccc ctgggcatcg cccccaccaa ggccaagctt accgtgcagg 3420
tgcgccagct gctgagcggc atcgtgcagc agcagagcaa cctgctgcgc gccatcgagg 3480
cccagcagca catgctgcag ctgaccgtgt ggggcatcaa gcagctgcag acccgcgtgc 3540
tggccatcga gcgctacctg cgcgaccagc agctcgagga catctggaac aacatgacct 3600
ggatgcagtg ggaccgcgag atcagcaact acaccaacac catctaccgc ctgctggagg 3660
acagccagaa ccagcaggag aagaacgagc aggacctgct ggccctggac aagtggcaga 3720
acctgtggac ctggttcggc atcaccaact ggctgtggta catcaagatc ttcatcaaga 3780
tcgtgggcgg cctgatcggc ctgcgcatca tcttcgccgt gctgagcatc tgaacacgtg 3840
ggatccagat ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctccccgtg 3900
ccttccttga ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt 3960
gcatcgcatt gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc 4020
aagggggagg attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt 4080
acccaggtgc tgaagaattg acccggttcc tcctgggcca gaaagaagca ggcacatccc 4140
cttctctgtg acacaccctg tccacgcccc tggttcttag ttccagcccc actcatagga 4200
cactcatagc tcaggagggc tccgccttca atcccacccg ctaaagtact tggagcggtc 4260
tctccctccc tcatcagccc accaaaccaa acctagcctc caagagtggg aagaaattaa 4320
agcaagatag gctattaagt gcagagggag agaaaatgcc tccaacatgt gaggaagtaa 4380
tgagagaaat catagaattt taaggccatc atggccttaa tcttccgctt cctcgctcac 4440
tgactcgctg cgctcggtcg ttcggctgcg gcgagcggta tcagctcact caaaggcggt 4500
aatacggtta tccacagaat caggggataa cgcaggaaag aacatgtgag caaaaggcca 4560
gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata ggctccgccc 4620
ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc cgacaggact 4680
ataaagatac caggcgtttc cccctggaag ctccctcgtg cgctctcctg ttccgaccct 4740
gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc tttctcatag 4800
ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca 4860
cgaacccccc gttcagcccg accgctgcgc cttatccggt aactatcgtc ttgagtccaa 4920
cccggtaaga cacgacttat cgccactggc agcagccact ggtaacagga ttagcagagc 4980
gaggtatgta ggcggtgcta cagagttctt gaagtggtgg cctaactacg gctacactag 5040
aagaacagta tttggtatct gcgctctgct gaagccagtt accttcggaa aaagagttgg 5100
tagctcttga tccggcaaac aaaccaccgc tggtagcggt ggtttttttg tttgcaagca 5160
gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt ctacggggtc 5220
tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat tatcaaaaag 5280
gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct aaagtatata 5340
tgagtaaact tggtctgaca gttaccaatg cttaatcagt gaggcaccta tctcagcgat 5400
ctgtctattt cgttcatcca tagttgcctg actcgggggg gggggcgct gaggtctgcc 5460
tcgtgaagaa ggtgttgctg actcatacca ggcctgaatc gccccatcat ccagccagaa 5520
agtgagggag ccacggttga tgagagcttt gttgtaggtg gaccagttgg tgattttgaa 5580
cttttgcttt gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa 5640
ctcagcaaaa gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc 5700
tgccagtgtt acaaccaatt aaccaattct gattagaaaa actcatcgag catcaaatga 5760
aactgcaatt tattcatatc aggattatca ataccatatt tttgaaaaag ccgtttctgt 5820
aatgaaggag aaaactcacc gaggcagttc cataggatgg caagatcctg gtatcggtct 5880
gcgattccga ctcgtccaac atcaatacaa cctattaatt tcccctcgtc aaaaataagg 5940
ttatcaagtg agaaatcacc atgagtgacg actgaatccg gtgagaatgg caaaagctta 6000
tgcatttctt tccagacttg ttcaacaggc cagccattac gctcgtcatc aaaatcactc 6060

gcatcaacca aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg 6120
ctgttaaaag gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc 6180
gcatcaacaa tattttcacc tgaatcagga tattcttcta atacctggaa tgctgttttc 6240
ccggggatcg cagtggtgag taaccatgca tcatcaggag tacggataaa atgcttgatg 6300
gtcggaagag gcataaattc cgtcagccag tttagtctga ccatctcatc tgtaacatca 6360
ttggcaacgc tacctttgcc atgtttcaga aacaactctg gcgcatcggg cttcccatac 6420
aatcgataga ttgtcgcacc tgattgcccg acattatcgc gagcccattt atacccatat 6480
aaatcagcat ccatgttgga atttaatcgc ggcctcgagc aagacgtttc ccgttgaata 6540
tggctcataa caccccttgt attactgttt atgtaagcag acagttttat tgttcatgat 6600
gatatatttt tatcttgtgc aatgtaacat cagagatttt gagacacaac gtggctttcc 6660
ccccccccc attattgaag catttatcag ggttattgtc tcatgagcgg atacatattt 6720
gaatgtattt agaaaaataa acaaataggg gttccgcgca catttccccg aaaagtgcca 6780
cctgacgtct aagaaaccat tattatcatg acattaacct ataaaaatag gcgtatcacg 6840
aggccctttc gtc 6853

<210> 91
<211> 6761
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 91
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gcgcggcatc cagaccagct ggcagaacct gtggcgctgg ggcaccatga 1980
tcctgggcat gctggtgatc tacagcgccg ccgagaacct gtgggtggcc gtgtactacg 2040
gcgtgcccgt gtggaaggac gccgagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacaccga ggtgcacaac gtgtgggaga cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggaggt ggacctggag aacgtgaccg aggacttcaa catgtggcgc aacaacatgg 2220
tggagcagat gcacaccgac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctggact gcaacgccac cgccagcaac gtgaccaacg 2340
agatgcgcaa ctgcagcttc aacatcacca ccgagctgaa ggacaagaag cagcaggtgt 2400
acagcctgtt ctacaagctg gacgtggtgc agatcaacga gaagaacgag accgacaagt 2460
accgcctgat caactgcaac accagcgcca tcacccaggc ctgccccaag gtgagcttcg 2520
agcccatccc catccactac tgcgcccccg ccggcttcgc catcctgaag tgcaaggaca 2580
ccgagttcaa cggcaccggc ccctgcaaga acgtgagcac cgtgcagtgc acccacggca 2640
tccgccccgt gatcagcacc cagctgctgc tgaacggcag cctggccgag gagggcatcc 2700
agatccgcag cgagaacatc accaacaacg ccaagaccat catcgtgcag ctggacaagg 2760
ccgtgaagat caactgcacc cgccccaaca acaacacccg caagggcgtg cgcatcggcc 2820
ccggccaggc cttctacgcc accggcggca tcatcggcga catccgccag gcccactgcc 2880
acgtgagccg cgccaagtgg aacgacaccc tgcgcggcgt ggccaagaag ctgcgcgagc 2940
acttcaagaa caagaccatc atcttcgaga agagcagcgg cggcgacatc gagatcacca 3000
cccacagctt catctgcggc ggcgagttct tctactgcaa caccagcggc ctgttcaaca 3060
gcacctggga gagcaacagc accgagagca acaacaccac cagcaacgac accatcaccc 3120
tgacctgccg catcaagcag atcatcaaca tgtggcagaa ggtgggccag gccatgtacc 3180
ccccccccat ccagggcgtg atccgctgcg agagcaacat caccggcctg ctgctgaccc 3240
gcgacggcgg caacaacagc accaacgaga tcttccgccc cggcggcggc aacatgcgcg 3300
acaactggcg cagcgagctg tacaagtaca aggtggtgaa gatcgagccc ctgggcgtgg 3360
cccccagccg cgccaagctt accgcccagg cccgccagct gctgagcggc atcgtgcagc 3420
agcagagcaa cctgctgcgc gccatcgagg cccagcagca catgctgaag ctgaccgtgt 3480
ggggcatcaa gcagctgcag gcccgcgtgc tggccgtgga gcgctacctg aaggaccagc 3540
agctcgagat ctgggacaac atgacctggc tgcagtggga caaggagatc agcaactaca 3600
cccagatcat ctacaacctg atcgaggaga gccagaacca gcaggagaag aacgagcagg 3660
acctgctggc cctggacaag tgggccagcc tgtggaactg gttcgacatc agccgctggc 3720
tgtggtgaac acgtgggatc cagatctgct gtgccttcta gttgccagcc atctgttgtt 3780
tgcccctccc ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa 3840
taaaatgagg aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg 3900
gtggggcagg acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg 3960
gtgggctcta tgggtaccca ggtgctgaag aattgacccg gttcctcctg ggccagaaag 4020
aagcaggcac atccccttct ctgtgacaca ccctgtccac gcccctggtt cttagttcca 4080
gccccactca taggacactc atagctcagg agggctccgc cttcaatccc acccgctaaa 4140
gtacttggag cggtctctcc ctcccctcatc agcccaccaa accaaaccta gcctccaaga 4200
gtgggaagaa attaaagcaa gataggctat taagtgcaga gggagagaaa atgcctccaa 4260
catgtgagga agtaatgaga gaaatcatag aattttaagg ccatgattta aggccatcat 4320
ggccttaatc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc 4380
gagcggtatc agctcactca aaggcggtaa tacggttatc cacagaatca ggggataacg 4440
caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 4500
tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat cgacgctcaa 4560
gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct 4620
ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc gcctttctcc 4680
cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt tcggtgtagg 4740
tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt tcagcccgac cgctgcgcct 4800
tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag 4860
cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca gagttcttga 4920
agtggtggcc taactacggc tacactagaa gaacagtatt tggtatctgc gctctgctga 4980
agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg 5040

gtagcggtgg ttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag 5100
aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac tcacgttaag 5160
ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat 5220
gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct 5280
taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac 5340
tcgggggggg ggggcgctga ggtctgcctc gtgaagaagg tgttgctgac tcataccagg 5400
cctgaatcgc cccatcatcc agccagaaag tgagggagcc acggttgatg agagctttgt 5460
tgtaggtgga ccagttggtg attttgaact tttgctttgc cacggaacgg tctgcgttgt 5520
cgggaagatg cgtgatctga tccttcaact cagcaaaagt tcgatttatt caacaaagcc 5580
gccgtcccgt caagtcagcg taatgctctg ccagtgttac aaccaattaa ccaattctga 5640
ttagaaaaac tcatcgagca tcaaatgaaa ctgcaattta ttcatatcag gattatcaat 5700
accatatttt tgaaaaagcc gtttctgtaa tgaaggagaa aactcaccga ggcagttcca 5760
taggatggca agatcctggt atcggtctgc gattccgact cgtccaacat caatacaacc 5820
tattaatttc ccctcgtcaa aaataaggtt atcaagtgag aaatcaccat gagtgacgac 5880
tgaatccggt gagaatggca aaagcttatg catttctttc cagacttgtt caacaggcca 5940
gccattacgc tcgtcatcaa aatcactcgc atcaaccaaa ccgttattca ttcgtgattg 6000
cgcctgagcg agacgaaata cgcgatcgct gttaaaagga caattacaaa caggaatcga 6060
atgcaaccgg cgcaggaaca ctgccagcgc atcaacaata ttttcacctg aatcaggata 6120
ttcttctaat acctggaatg ctgttttccc ggggatcgca gtggtgagta accatgcatc 6180
atcaggagta cggataaaat gcttgatggt cggaagaggc ataaattccg tcagccagtt 6240
tagtctgacc atctcatctg taacatcatt ggcaacgcta cctttgccat gtttcagaaa 6300
caactctggc gcatcgggct tcccatacaa tcgatagatt gtcgcacctg attgcccgac 6360
attatcgcga gcccatttat acccatataa atcagcatcc atgttggaat ttaatcgcgg 6420
cctcgagcaa gacgtttccc gttgaatatg gctcataaca ccccttgtat tactgtttat 6480
gtaagcagac agttttattg ttcatgatga tatattttta tcttgtgcaa tgtaacatca 6540
gagattttga gacacaacgt ggctttcccc ccccccccat tattgaagca tttatcaggg 6600
ttattgtctc atgagcggat acatatttga atgtatttag aaaaataaac aaatagggggt 6660
tccgcgcaca tttccccgaa aagtgccacc tgacgtctaa gaaaccatta ttatcatgac 6720
attaacctat aaaaataggc gtatcacgag gccctttcgt c 6761

<210> 92
<211> 6836
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 92
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840

ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gcgcggcatc cagaccagct ggcagaacct gtggcgctgg ggcaccatga 1980
tcctgggcat gctggtgatc tacagcgccg ccgagaacct gtgggtggcc gtgtactacg 2040
gcgtgcccgt gtggaaggac gccgagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacaccga ggtgcacaac gtgtgggaga cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggaggt ggacctggag aacgtgaccg aggacttcaa catgtggcgc aacaacatgg 2220
tggagcagat gcacaccgac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctggact gcaacgccac cgccagcaac gtgaccaacg 2340
agatgcgcaa ctgcagcttc aacatcacca ccgagctgaa ggacaagaag cagcaggtgt 2400
acagcctgtt ctacaagctg gacgtggtgc agatcaacga gaagaacgag accgacaagt 2460
accgcctgat caactgcaac accagcgcca tcacccaggc ctgccccaag gtgagcttcg 2520
agcccatccc catccactac tgcgcccccg ccggcttcgc catcctgaag tgcaaggaca 2580
ccgagttcaa cggcaccggc ccctgcaaga acgtgagcac cgtgcagtgc acccacggca 2640
tccgccccgt gatcagcacc cagctgctgc tgaacggcag cctggccgag gagggcatcc 2700
agatccgcag cgagaacatc accaacaacg ccaagaccat catcgtgcag ctggacaagg 2760
ccgtgaagat caactgcacc cgccccaaca acaacacccg caagggcgtg cgcatcggcc 2820
ccggccaggc cttctacgcc accggcggca tcatcggcga catccgccag gcccactgcc 2880
acgtgagccg cgccaagtgg aacgacaccc tgcgcggcgt ggccaagaag ctgcgcgagc 2940
acttcaagaa caagaccatc atcttcgaga agagcagcgg cggcgacatc gagatcacca 3000
cccacagctt catctgcggc ggcgagttct tctactgcaa caccagcggc ctgttcaaca 3060
gcacctggga gagcaacagc accgagagca acaacaccac cagcaacgac accatcaccc 3120
tgacctgccg catcaagcag atcatcaaca tgtggcagaa ggtgggccag gccatgtacc 3180
ccccccccat ccagggcgtg atccgctgcg agagcaacat caccggcctg ctgctgaccc 3240
gcgacggcgg caacaacagc accaacgaga tcttccgccc cggcggcggc aacatgcgcg 3300
acaactggcg cagcgagctg tacaagtaca aggtggtgaa gatcgagccc ctgggcgtgg 3360
cccccagccg cgccaagctt accgcccagg cccgccagct gctgagcggc atcgtgcagc 3420
agcagagcaa cctgctgcgc gccatcgagg cccagcagca catgctgaag ctgaccgtgt 3480
ggggcatcaa gcagctgcag gcccgcgtgc tggccgtgga gcgctacctg aaggaccagc 3540
agctcgagat ctgggacaac atgacctggc tgcagtggga caaggagatc agcaactaca 3600
cccagatcat ctacaacctg atcgaggaga gccagaacca gcaggagaag aacgagcagg 3660
acctgctggc cctggacaag tgggccagcc tgtggaactg gttcgacatc agccgctggc 3720
tgtggtacat caagatcttc atcatgatcg tgggcggcct gatcggcctg cgcatcgtgt 3780
tcgccgtgct gagcgtgatc tgaacacgtg ggatccagat ctgctgtgcc ttctagttgc 3840
cagccatctg ttgtttgccc ctccccccgtg ccttccttga ccctggaagg tgccactccc 3900
actgtccttt cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct 3960
attctggggg gtggggtggg gcaggacagc aagggggagg attgggaaga caatagcagg 4020
catgctgggg atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc 4080
tcctgggcca gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc 4140

tggttcttag ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca 4200
atcccacccg ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa 4260
acctagcctc caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag 4320
agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg 4380
atttaaggcc atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg 4440
tcgttcggct gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag 4500
aatcagggga taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc 4560
gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg cccccctgac gagcatcaca 4620
aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt 4680
ttcccccctgg aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc 4740
tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc 4800
tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc 4860
ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact 4920
tatcgccact ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg 4980
ctacagagtt cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta 5040
tctgcgctct gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca 5100
aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa 5160
aaaaaggatc tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg 5220
aaaactcacg ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc 5280
ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg 5340
acagttacca atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat 5400
ccatagttgc ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg 5460
ctgactcata ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt 5520
tgatgagagc tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg 5580
aacggtctgc gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat 5640
ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca 5700
attaaccaat tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat 5760
atcaggatta tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc 5820
accgaggcag ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc 5880
aacatcaata caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc 5940
accatgagtg acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac 6000
ttgttcaaca ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt 6060
attcattcgt gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt 6120
acaaacagga atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc 6180
acctgaatca ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt 6240
gagtaaccat gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa 6300
ttccgtcagc cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt 6360
gccatgtttc agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc 6420
acctgattgc ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt 6480
ggaatttaat cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct 6540
tgtattactg tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg 6600
tgcaatgtaa catcagagat tttgagacac aacgtggctt tccccccccc cccattattg 6660
aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa 6720
taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac 6780
cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6836

<210> 93
<211> 6800
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 93
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gaaggagacc cagatgaact ggcctaacct gtggaagtgg ggcatcctga 1980
tcctgggcct ggtgatcatc tgcagcgcca gcgacaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggcgcgac gccgacacca ccctgttctg cgccagcgac gccaaggccc 2100
acgagaccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggaggt ggacctggag aacatcaccg agaacttcaa catgtggaag aacaacatgg 2220
tggagcagat gcaggaggac gtgatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgaact gcatcaacgc caacctgacc aacgtgaaca 2340
acatcatcca cggccccaac atcatcggca acatcaccga cgaggtgcgc aactgcagct 2400
tcaacatgac caccgagatc cgcgacaaga agcagaaggt gcacgccctg ttctacaagc 2460
tggacctggt gcagatcgag gacaagaaca gcagcgagta ccgcctgatc aactgcaaca 2520
ccagcgtgat caagcaggcc tgccccaaga tcagcttcga ccccatcccc atccactact 2580
gcaccccccgc cggctacgcc atcctgaagt gcaacgacaa gaacttcaac ggcaccggcc 2640
cctgcaccaa cgtgagcagc gtgcagtgca cccacggcat caagcccgtg gtgagcaccc 2700
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc gagaacctga 2760
ccaacaacgc caagaccatc atcgtgcacc tgaacaagag cgtggagatc aactgcaccc 2820
gccccagcaa caacacccgc accagcacca ccatcggccc cggccaggtg ttctaccgca 2880
ccggcgacat caccggcaac atccgcaagg cctactgcga gatcaacggc accaagtgga 2940
acgaggccct gaagcaggtg accaagaagc tgaaggagca cttcaacaac aagaccatca 3000
tcttccagcc ccccagcggc ggcgacctgg agatcaccat gcaccacttc aactgccgcg 3060
gcgagttctt ctactgcaac accacccgcc tgttcaacaa cacctgcatc ggcaacgaga 3120
ccatcggcgg ctgcaacgac accatcatcc tgccctgcaa gatcaagcag atcatcaaca 3180

tgtggcaggg cgccggcctg gccatgtacg ccccccccat cagcggccgc atcaactgcg 3240
tgagcaacat caccggcatc ctgctgaccc gcgacggcgg cgccaacaac accagcaacg 3300
agatcttccg ccccggcggc ggcaacatca aggacaactg gcgcagcgag ctgtacaagt 3360
acaaggtggt gcagatcgag cccctgggca tcgcccccac ccgcgccaag cttaccgtgc 3420
aggcccgcca gctggtgagc ggcatcgtgc agcagcagag caacctgctg cgcgccatcg 3480
aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg caggcccgcg 3540
tgctggccgt ggagcgctac ctgaaggacc agaagttcct cgaggagatc tggagcaaca 3600
tgacctggat cgagtgggag cgcgagatca gcaactacac caaccagatc tacgagatcc 3660
tgaccgagag ccagaaccag caggaccgca acgagaagga cctgctggag ctggacaagt 3720
gggcgagcct gtggagctgg ttcgacatca ccaactggct gtggtgaaca cgtgggatcc 3780
agatctgctg tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc 3840
ttgaccctgg aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg 3900
cattgtctga gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg 3960
gaggattggg aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag 4020
gtgctgaaga attgacccgg ttcctcctgg gccagaaaga agcaggcaca tcccccttctc 4080
tgtgacacac cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca 4140
tagctcagga gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc 4200
tccctcatca gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag 4260
ataggctatt aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag 4320
aaatcataga attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct 4380
cgctcactga ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa 4440
aggcggtaat acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa 4500
aaggccagca aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc 4560
tccgcccccc tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga 4620
caggactata aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc 4680
cgaccctgcc gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt 4740
ctcatagctc acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct 4800
gtgtgcacga acccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg 4860
agtccaaccc ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta 4920
gcagagcgag gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct 4980
acactagaag aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa 5040
gagttggtag ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt 5100
gcaagcagca gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta 5160
cggggtctga cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat 5220
caaaaaggat cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa 5280
gtatatatga gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct 5340
cagcgatctg tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag 5400
gtctgcctcg tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca 5460
gccagaaagt gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga 5520
ttttgaactt ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat 5580
ccttcaactc agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt 5640
aatgctctgc cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat 5700
caaatgaaac tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg 5760
tttctgtaat gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta 5820
tcggtctgcg attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa 5880
aataaggtta tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa 5940
aagcttatgc atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa 6000
atcactcgca tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac 6060
gcgatcgctg ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac 6120
tgccagcgca tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc 6180
tgttttcccg gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg 6240
cttgatggtc ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt 6300
aacatcattg gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt 6360
cccatacaat cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata 6420
cccatataaa tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg 6480

ttgaatatgg ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt 6540
tcatgatgat atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg 6600
gctttccccc ccccccattt attgaagcat ttatcagggt tattgtctca tgagcggata 6660
catatttgaa tgtatttaga aaaataaaca aataggggtt ccgcgcacat ttccccgaaa 6720
agtgccacct gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg 6780
tatcacgagg ccctttcgtc 6800

<210> 94
<211> 6872
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 94
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt gaaggagacc cagatgaact ggcctaacct gtggaagtgg ggcatcctga 1980
tcctgggcct ggtgatcatc tgcagcgcca gcgacaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggcgcgac gccgacacca ccctgttctg cgccagcgac gccaaggccc 2100
acgagaccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggaggt ggacctggag aacatcaccg agaacttcaa catgtggaag aacaacatgg 2220

tggagcagat gcaggaggac gtgatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgaact gcatcaacgc caacctgacc aacgtgaaca 2340
acatcatcca cggccccaac atcatcggca acatcaccga cgaggtgcgc aactgcagct 2400
tcaacatgac caccgagatc cgcgacaaga agcagaaggt gcacgccctg ttctacaagc 2460
tggacctggt gcagatcgag gacaagaaca gcagcgagta ccgcctgatc aactgcaaca 2520
ccagcgtgat caagcaggcc tgccccaaga tcagcttcga ccccatcccc atccactact 2580
gcaccccccgc cggctacgcc atcctgaagt gcaacgacaa gaacttcaac ggcaccggcc 2640
cctgcaccaa cgtgagcagc gtgcagtgca cccacggcat caagcccgtg gtgagcaccc 2700
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc gagaacctga 2760
ccaacaacgc caagaccatc atcgtgcacc tgaacaagag cgtggagatc aactgcaccc 2820
gccccagcaa caacacccgc accagcacca ccatcggccc cggccaggtg ttctaccgca 2880
ccggcgacat caccggcaac atccgcaagg cctactgcga gatcaacggc accaagtgga 2940
acgaggccct gaagcaggtg accaagaagc tgaaggagca cttcaacaac aagaccatca 3000
tcttccagcc ccccagcggc ggcgacctgg agatcaccat gcaccacttc aactgccgcg 3060
gcgagttctt ctactgcaac accacccgcc tgttcaacaa cacctgcatc ggcaacgaga 3120
ccatcggcgg ctgcaacgac accatcatcc tgccctgcaa gatcaagcag atcatcaaca 3180
tgtggcaggg cgccggcctg gccatgtacg ccccccccat cagcggccgc atcaactgcg 3240
tgagcaacat caccggcatc ctgctgaccc gcgacggcgg cgccaacaac accagcaacg 3300
agatcttccg ccccggcggc ggcaacatca aggacaactg gcgcagcgag ctgtacaagt 3360
acaaggtggt gcagatcgag cccctgggca tcgcccccac ccgcgccaag cttaccgtgc 3420
aggcccgcca gctggtgagc ggcatcgtgc agcagcagag caacctgctg cgcgccatcg 3480
aggcccagca gcacctgctg cagctgaccg tgtggggcat caagcagctg caggcccgcg 3540
tgctggccgt ggagcgctac ctgaaggacc agaagttcct cgaggagatc tggagcaaca 3600
tgacctggat cgagtgggag cgcgagatca gcaactacac caaccagatc tacgagatcc 3660
tgaccgagag ccagaaccag caggaccgca acgagaagga cctgctggag ctggacaagt 3720
gggcgagcct gtggagctgg ttcgacatca ccaactggct gtggtacatc aagatcttca 3780
tcatgatcgt gggcggcctg atcggcctgc gcatcatctt cgccgtgctg agcatctgaa 3840
cacgtgggat ccagatctgc tgtgccttct agttgccagc catctgttgt ttgcccctcc 3900
cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta ataaaatgag 3960
gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg ggtggggcag 4020
gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct 4080
atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa gaagcaggca 4140
catcccctc tctgtgacac accctgtcca cgcccctggt tcttagttcc agccccactc 4200
ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa agtacttgga 4260
gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag agtgggaaga 4320
aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca acatgtgagg 4380
aagtaatgag agaaatcata gaattttaag gccatgattt aaggccatca tggccttaat 4440
cttccgcttc ctcgctcact gactcgctgc gctcggtcgt tcggctgcgg cgagcggtat 4500
cagctcactc aaaggcggta atacggttat ccacagaatc aggggataac gcaggaaaga 4560
acatgtgagc aaaaggccag caaaaggcca ggaaccgtaa aaaggccgcg ttgctggcgt 4620
ttttccatag gctccgcccc cctgacgagc atcacaaaaa tcgacgctca agtcagaggt 4680
ggcgaaaccc gacaggacta taaagatacc aggcgtttcc ccctggaagc tccctcgtgc 4740
gctctcctgt tccgaccctg ccgcttaccg gatacctgtc cgcctttctc ccttcgggaa 4800
gcgtggcgct ttctcatagc tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct 4860
ccaagctggg ctgtgtgcac gaacccccccg ttcagcccga ccgctgcgcc ttatccggta 4920
actatcgtct tgagtccaac ccggtaagac acgacttatc gccactggca gcagccactg 4980
gtaacaggat tagcagagcg aggtatgtag gcggtgctac agagttcttg aagtggtggc 5040
ctaactacgg ctacactaga agaacagtat ttggtatctg cgctctgctg aagccagtta 5100
ccttcggaaa aagagttggt agctcttgat ccggcaaaca aaccaccgct ggtagcggtg 5160
gtttttttgt ttgcaagcag cagattacgc gcagaaaaaa aggatctcaa gaagatcctt 5220
tgatcttttc tacggggtct gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg 5280
tcatgagatt atcaaaaagg atcttcacct agatcctttt aaattaaaaa tgaagtttta 5340
aatcaatcta aagtatatat gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg 5400
aggcacctat ctcagcgatc tgtctatttc gttcatccat agttgcctga ctcgggggggg 5460
gggggcgctg aggtctgcct cgtgaagaag gtgttgctga ctcataccag gcctgaatcg 5520

ccccatcatc cagccagaaa gtgagggagc cacggttgat gagagctttg ttgtaggtgg 5580
accagttggt gattttgaac ttttgctttg ccacggaacg gtctgcgttg tcgggaagat 5640
gcgtgatctg atccttcaac tcagcaaaag ttcgatttat tcaacaaagc cgccgtcccg 5700
tcaagtcagc gtaatgctct gccagtgtta caaccaatta accaattctg attagaaaaa 5760
ctcatcgagc atcaaatgaa actgcaattt attcatatca ggattatcaa taccatattt 5820
ttgaaaaagc cgtttctgta atgaaggaga aaactcaccg aggcagttcc ataggatggc 5880
aagatcctgg tatcggtctg cgattccgac tcgtccaaca tcaatacaac ctattaattt 5940
cccctcgtca aaaataaggt tatcaagtga gaaatcacca tgagtgacga ctgaatccgg 6000
tgagaatggc aaaagcttat gcatttcttt ccagacttgt tcaacaggcc agccattacg 6060
ctcgtcatca aaatcactcg catcaaccaa accgttattc attcgtgatt gcgcctgagc 6120
gagacgaaat acgcgatcgc tgttaaaagg acaattacaa acaggaatcg aatgcaaccg 6180
gcgcaggaac actgccagcg catcaacaat attttcacct gaatcaggat attcttctaa 6240
tacctggaat gctgttttcc cggggatcgc agtggtgagt aaccatgcat catcaggagt 6300
acggataaaa tgcttgatgg tcggaagagg cataaattcc gtcagccagt ttagtctgac 6360
catctcatct gtaacatcat tggcaacgct acctttgcca tgtttcagaa acaactctgg 6420
cgcatcgggc ttcccatata atcgatagat tgtcgcacct gattgcccga cattatcgcg 6480
agcccattta tacccatata aatcagcatc catgttggaa tttaatcgcg gcctcgagca 6540
agacgtttcc cgttgaatat ggctcataac accccttgta ttactgttta tgtaagcaga 6600
cagttttatt gttcatgatg atatattttt atcttgtgca atgtaacatc agagattttg 6660
agacacaacg tggctttccc ccccccccca ttattgaagc atttatcagg gttattgtct 6720
catgagcgga tacatatttg aatgtattta gaaaaataaa caaatagggg ttccgcgcac 6780
atttccccga aaagtgccac ctgacgtcta agaaaccatt attatcatga cattaaccta 6840
taaaaatagg cgtatcacga ggccctttcg tc 6872

<210> 95
<211> 6757
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 95
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200

tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaatacа tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt ccgaacaaca 2820
acacccgtaa atccatgcgt atcggtccgg gtcagacctt ctacgctacc ggtgacatca 2880
tcggtgacat ccgtcaggct tactgcaaca tctccggttc caaatggaac gaaaccctga 2940
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 3000
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 3060
tctactgcaa caccacccgt ctgttcaaca acaacgctac cgaagacgaa accatcaccc 3120
tgccgtgccg tatcaaacag atcatcaaca tgtggcaggg tgttggtcgt gctatgtacg 3180
ctccgccgat cgctggtaac atcacctgca aatccaacat caccggtctg ctgctggttc 3240
gtgacggtgg tgaagacaac aaaaccgaag aaatcttccg tccgggtggt ggtaacatga 3300
aagacaactg gcgttccgaa ctgtacaaat acaaagttat cgaactgaaa ccgctgggta 3360
tcgctccgac cggtgctaag cttaccgttc aggctcgtca gctgctgtcc tccatcgttc 3420
agcagcagtc caacctgctg cgtgctatcg aagctcagca gcacatgctg cagctgaccg 3480
tttggggtat caaacagctg cagacccgtg ttctggctat cgaacgttac ctgaaagacc 3540
agcagctcga gatctggaac aacatgacct ggatggaatg ggaccgtgaa atctccaact 3600
acaccgacac catctaccgt ctgctggaag actcccagac ccagcaggaa aaaaacgaaa 3660
aagacctgct ggctctggac tcctggaaaa acctgtggtc ctggttcgac atctccaact 3720
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3780
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3840
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3900
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3960
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 4020
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 4080
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 4140
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4200
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4260
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4320
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4380
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4440
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4500

ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac gctcaagtca 4560
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4620
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4680
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4740
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4800
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4860
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4920
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4980
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 5040
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 5100
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 5160
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5220
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5280
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5340
gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5400
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5460
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5520
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5580
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5640
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5700
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5760
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5820
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5880
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5940
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 6000
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 6060
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 6120
tctaatacct ggaatgctgt tttccgggg atcgcagtgg tgagtaacca tgcatcatca 6180
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6240
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6300
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6360
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6420
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6480
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6540
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6600
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6660
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6720
acctataaaa ataggcgtat cacgaggccc tttcgtc 6757

<210> 96
<211> 6829
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 96
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300

tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaataca tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt ccgaacaaca 2820
acacccgtaa atccatgcgt atcggtccgg gtcagacctt ctacgctacc ggtgacatca 2880
tcggtgacat ccgtcaggct tactgcaaca tctccggttc caaatggaac gaaaccctga 2940
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 3000
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 3060
tctactgcaa caccacccgt ctgttcaaca acaacgctac cgaagacgaa accatcaccc 3120
tgccgtgccg tatcaaacag atcatcaaca tgtggcaggg tgttggtcgt gctatgtacg 3180
ctccgccgat cgctggtaac atcacctgca aatccaacat caccggtctg ctgctggttc 3240
gtgacggtgg tgaagacaac aaaaccgaag aaatcttccg tccgggtggt ggtaacatga 3300
aagacaactg gcgttccgaa ctgtacaaat acaaagttat cgaactgaaa ccgctgggta 3360
tcgctccgac cggtgctaag cttaccgttc aggctcgtca gctgctgtcc tccatcgttc 3420
agcagcagtc caacctgctg cgtgctatcg aagctcagca gcacatgctg cagctgaccg 3480
tttggggtat caaacagctg cagacccgtg ttctggctat cgaacgttac ctgaaagacc 3540
agcagctcga gatctggaac aacatgacct ggatggaatg ggaccgtgaa atctccaact 3600

acaccgacac catctaccgt ctgctggaag actcccagac ccagcaggaa aaaaacgaaa 3660
aagacctgct ggctctggac tcctggaaaa acctgtggtc ctggttcgac atctccaact 3720
ggctgtggta catcaaaatc ttcatcatga tcgttggtgg tctgatcggt ctgcgtatca 3780
tcttcgctgt tctgtccatc tgaggatcca gatctgctgt gccttctagt tgccagccat 3840
ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact cccactgtcc 3900
tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat tctattctgg 3960
ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc aggcatgctg 4020
gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt tcctcctggg 4080
ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc ccctggttct 4140
tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct tcaatcccac 4200
ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac caaacctagc 4260
ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg gagagaaaat 4320
gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc atgatttaag 4380
gccatcatgg ccttaatctt ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg 4440
gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca cagaatcagg 4500
ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa 4560
ggccgcgttg ctggcgtttt tccataggct ccgccccct gacgagcatc acaaaaatcg 4620
acgctcaagt cagaggtggc gaaacccgac aggactataa agataccagg cgtttccccc 4680
tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg cttaccggat acctgtccgc 4740
ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt atctcagttc 4800
ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa ccccccgttc agcccgaccg 4860
ctgcgcctta tccggtaact atcgtcttga gtccaacccg gtaagacacg acttatcgcc 4920
actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg gtgctacaga 4980
gttcttgaag tggtggccta actacggcta cactagaaga acagtatttg gtatctgcgc 5040
tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg gcaaacaaac 5100
caccgctggt agcggtggtt tttttgtttg caagcagcag attacgcgca gaaaaaaagg 5160
atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagtgga acgaaaactc 5220
acgttaaggg attttggtca tgagattatc aaaaaggatc ttcacctaga tccttttaaa 5280
ttaaaaatga agttttaaat caatctaaag tatatatgag taaacttggt ctgacagtta 5340
ccaatgctta atcagtgagg cacctatctc agcgatctgt ctatttcgtt catccatagt 5400
tgcctgactc ggggggggg ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc 5460
ataccaggcc tgaatcgccc catcatccag ccagaaagtg agggagccac ggttgatgag 5520
agctttgttg taggtggacc agttggtgat tttgaacttt tgctttgcca cggaacggtc 5580
tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca gcaaaagttc gatttattca 5640
acaaagccgc cgtcccgtca agtcagcgta atgctctgcc agtgttacaa ccaattaacc 5700
aattctgatt agaaaaactc atcgagcatc aaatgaaact gcaatttatt catatcagga 5760
ttatcaatac catatttttg aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg 5820
cagttccata ggatggcaag atcctggtat cggtctgcga ttccgactcg tccaacatca 5880
atacaaccta ttaatttccc ctcgtcaaaa ataaggttat caagtgagaa atcaccatga 5940
gtgacgactg aatccggtga gaatggcaaa agcttatgca tttctttcca gacttgttca 6000
acaggccagc cattacgctc gtcatcaaaa tcactcgcat caaccaaacc gttattcatt 6060
cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt taaaaggaca attacaaaca 6120
ggaatcgaat gcaaccggcg caggaacact gccagcgcat caacaatatt ttcacctgaa 6180
tcaggatatt cttctaatac ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac 6240
catgcatcat caggagtacg gataaaatgc ttgatggtcg gaagaggcat aaattccgtc 6300
agccagttta gtctgaccat ctcatctgta acatcattgg caacgctacc tttgccatgt 6360
ttcagaaaca actctggcgc atcgggcttc ccatacaatc gatagattgt cgcacctgat 6420
tgcccgacat tatcgcgagc ccatttatac ccatataaat cagcatccat gttggaattt 6480
aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc tcataacacc ccttgtatta 6540
ctgtttatgt aagcagacag ttttattgtt catgatgata tatttttatc ttgtgcaatg 6600
taacatcaga gattttgaga cacaacgtgg ctttcccccc ccccccatta ttgaagcatt 6660
tatcagggtt attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa 6720
atagggttc cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt 6780
atcatgacat taacctataa aaataggcgt atcacgaggc cctttcgtc 6829

<210> 97
<211> 6752
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 97
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640

gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccc caacaacaac acccgcaaga gcatccgcat cggccccggc caggccttct 2820
acgccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacatc agccgcaccg 2880
cctggaacaa gaccctgcag gaggtgggca agaagctggc cgagcacttc cccaacaagg 2940
ccatcaagtt cgccaagcac agcggcggcg acctggagat caccacccac agcttcaact 3000
gccgcggcga gttcttctac tgcaacacca gcagcctgtt caacagcacc tacaccccca 3060
acagcaccga gaacatcacc ggcaccgaga acagcatcat caccatcccc tgccgcatca 3120
agcagatcat caacatgtgg cagggcgtgg gccgcgccat gtacgccccc cccatcgagg 3180
gcatcctgac ctgccgcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaccg 3240
gcatgcacga caccgagatc ttccgccccg agggcggcga catgcgcgac aactggcgca 3300
gcgagctgta caagtacaag gtggtggaga tcaagcccct gggcatcgcc cccaccaagg 3360
ccaagcttac cgtgcaggtg cgccagctgc tgagcggcat cgtgcagcag cagagcaacc 3420
tgctgcgcgc catcgaggcc cagcagcaca tgctgcagct gaccgtgtgg ggcatcaagc 3480
agctgcagac ccgcgtgctg gccatcgagc gctacctgcg cgaccagcag ctcgaggaca 3540
tctggaacaa catgacctgg atgcagtggg accgcgagat cagcaactac accaacacca 3600
tctaccgcct gctggaggac agccagaacc agcaggagaa gaacgagcag gacctgctgg 3660
ccctggacaa gtggcagaac ctgtggacct ggttcggcat caccaactgg ctgtggtgaa 3720
cacgtgggat ccagatctgc tgtgccttct agttgccagc catctgttgt ttgcccctcc 3780
cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta ataaaatgag 3840
gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg ggtggggcag 3900
gacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct 3960
atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa gaagcaggca 4020
catcccctc tctgtgacac accctgtcca cgcccctggt tcttagttcc agccccactc 4080
ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa agtacttgga 4140
gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag agtgggaaga 4200
aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca acatgtgagg 4260
aagtaatgag agaaatcata gaattttaag gccatgattt aaggccatca tggccttaat 4320
cttccgcttc ctcgctcact gactcgctgc gctcggtcgt tcggctgcgg cgagcggtat 4380
cagctcactc aaaggcggta atacggttat ccacagaatc aggggataac gcaggaaaga 4440
acatgtgagc aaaaggccag caaaaggcca ggaaccgtaa aaaggccgcg ttgctggcgt 4500
ttttccatag gctccgcccc cctgacgagc atcacaaaaa tcgacgctca agtcagaggt 4560
ggcgaaaccc gacaggacta taaagatacc aggcgtttcc ccctggaagc tccctcgtgc 4620
gctctcctgt tccgaccctg ccgcttaccg gatacctgtc cgcctttctc ccttcgggaa 4680
gcgtggcgct ttctcatagc tcacgctgta ggtatctcag ttcggtgtag gtcgttcgct 4740
ccaagctggg ctgtgtgcac gaacccccgg ttcagcccga ccgctgcgcc ttatccggta 4800
actatcgtct tgagtccaac ccggtaagac acgacttatc gccactggca gcagccactg 4860
gtaacaggat tagcagagcg aggtatgtag gcggtgctac agagttcttg aagtggtggc 4920
ctaactacgg ctacactaga agaacagtat ttggtatctg cgctctgctg aagccagtta 4980
ccttcggaaa aagagttggt agctcttgat ccggcaaaca aaccaccgct ggtagcggtg 5040
gttttttgt ttgcaagcag cagattacgc gcagaaaaaa aggatctcaa gaagatcctt 5100
tgatcttttc tacggggtct gacgctcagt ggaacgaaaa ctcacgttaa gggattttgg 5160
tcatgagatt atcaaaaagg atcttcacct agatcctttt aaattaaaaa tgaagtttta 5220
aatcaatcta aagtatatat gagtaaactt ggtctgacag ttaccaatgc ttaatcagtg 5280
aggcacctat ctcagcgatc tgtctatttc gttcatccat agttgcctga ctcgggggggg 5340
gggggcgctg aggtctgcct cgtgaagaag gtgttgctga ctcataccag gcctgaatcg 5400
ccccatcatc cagccagaaa gtgagggagc cacggttgat gagagctttg ttgtaggtgg 5460
accagttggt gattttgaac ttttgctttg ccacggaacg gtctgcgttg tcgggaagat 5520
gcgtgatctg atccttcaac tcagcaaaag ttcgatttat tcaacaaagc cgccgtcccg 5580
tcaagtcagc gtaatgctct gccagtgtta caaccaatta accaattctg attagaaaaa 5640
ctcatcgagc atcaaatgaa actgcaattt attcatatca ggattatcaa taccatattt 5700
ttgaaaaagc cgtttctgta atgaaggaga aaactcaccg aggcagttcc ataggatggc 5760
aagatcctgg tatcggtctg cgattccgac tcgtccaaca tcaatacaac ctattaattt 5820
cccctcgtca aaaataaggt tatcaagtga gaaatcacca tgagtgacga ctgaatccgg 5880
tgagaatggc aaaagcttat gcatttcttt ccagacttgt tcaacaggcc agccattacg 5940

ctcgtcatca aaatcactcg catcaaccaa accgttattc attcgtgatt gcgcctgagc 6000
gagacgaaat acgcgatcgc tgttaaaagg acaattacaa acaggaatcg aatgcaaccg 6060
gcgcaggaac actgccagcg catcaacaat attttcacct gaatcaggat attcttctaa 6120
tacctggaat gctgttttcc cggggatcgc agtggtgagt aaccatgcat catcaggagt 6180
acggataaaa tgcttgatgg tcggaagagg cataaattcc gtcagccagt ttagtctgac 6240
catctcatct gtaacatcat tggcaacgct acctttgcca tgtttcagaa acaactctgg 6300
cgcatcgggc ttcccatata atcgatagat tgtcgcacct gattgcccga cattatcgcg 6360
agcccattta tacccatata aatcagcatc catgttggaa tttaatcgcg gcctcgagca 6420
agacgtttcc cgttgaatat ggctcataac acccccttgta ttactgttta tgtaagcaga 6480
cagttttatt gttcatgatg atatattttt atcttgtgca atgtaacatc agagattttg 6540
agacacaacg tggctttccc ccccccccca ttattgaagc atttatcagg gttattgtct 6600
catgagcgga tacatatttg aatgtattta gaaaaataaa caaatagggg ttccgcgcac 6660
atttccccga aaagtgccac ctgacgtcta agaaaccatt attatcatga cattaaccta 6720
taaaaatagg cgtatcacga ggccctttcg tc 6752

<210> 98
<211> 6623
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 98
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccgct 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
ccaacaacaa cacccgcaag agcatccgca tcggcccggg ccaggccttc tacgccaccg 2700
gcgagatcat cggcgacatc cgccaggccc actgcaacat cagccgcacc gcctggaaca 2760
agaccctgca ggaggtgggc aagaagctgg ccgagcactt ccccaacaag gccatcaagt 2820
tcgccaagca cagcggcggc gacctggaga tcaccaccca cagcttcaac tgccgcggcg 2880
agttcttcta ctgcaacacc agcagcctgt tcaacagcac ctacaccccc aacagcaccg 2940
agaacatcac cggcaccgag aacagcatca tcaccatccc ctgccgcatc aagcagatca 3000
tcaacatgtg gcagggcgtg ggccgcgcca tgtacgcccc ccccatcgag ggcatcctga 3060
cctgccgcag caacatcacc ggcctgctgc tgacccgcga cggcggcacc ggcatgcacg 3120
acaccgagat cttccgcccc gagggcggcg acatgcgcga caactggcgc agcgagctgt 3180
acaagtacaa ggtggtggag atcaagcccc tgggcatcgc ccccaccaag gccaagctta 3240
ccgtgcaggt gcgccagctg ctgagcggca tcgtgcagca gcagagcaac ctgctgcgcg 3300
ccatcgaggc ccagcagcac atgctgcagc tgaccgtgtg gggcatcaag cagctgcaga 3360
cccgcgtgct ggccatcgag cgctacctgc gcgaccagca gctcgaggac atctggaaca 3420
acatgacctg gatgcagtgg gaccgcgaga tcagcaacta caccaacacc atctaccgcc 3480
tgctggagga cagccagaac cagcaggaga agaacgagca ggacctgctg gccctggaca 3540
agtggcagaa cctgtggacc tggttcggca tcaccaactg gctgtggtga acacgtggga 3600
tccagatctg ctgtgccttc tagttgccag ccatctgttg tttgcccctc ccccgtgcct 3660
tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca 3720
tcgcattgtc tgagtaggtg tcattctatt ctgggggggtg gggtggggca ggacagcaag 3780
ggggaggatt gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc 3840
caggtgctga agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt 3900
ctctgtgaca caccctgtcc acgcccctgg ttcttagttc cagccccact cataggacac 3960
tcatagctca ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct 4020
ccctccctca tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc 4080
aagataggct attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga 4140
gagaaatcat agaatttaa ggccatgatt taaggccatc atggccttaa tcttccgctt 4200
cctcgctcac tgactcgctg cgctcggtcg ttcggctgcg gcgagcggta tcagctcact 4260
caaaggcggt aatacggtta tccacagaat caggggataa cgcaggaaag aacatgtgag 4320
caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata 4380
ggctccgccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc 4440
cgacaggact ataaagatac caggcgtttc cccctggaag ctccctcgtg cgctctcctg 4500
ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc 4560
tttctcatag ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc tccaagctgg 4620
gctgtgtgca cgaacccccc gttcagcccg accgctgcgc cttatccggt aactatcgtc 4680
ttgagtccaa cccggtaaga cacgacttat cgccactggc agcagccact ggtaacagga 4740
ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtggtgg cctaactacg 4800
gctacactag aagaacagta tttggtatct gcgctctgct gaagccagtt accttcggaa 4860
aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggt ggtttttttg 4920
tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt 4980
ctacggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat 5040

tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct 5100
aaagtatata tgagtaaact tggtctgaca gttaccaatg cttaatcagt gaggcaccta 5160
tctcagcgat ctgtctattt cgttcatcca tagttgcctg actcgggggg gggggcgct 5220
gaggtctgcc tcgtgaagaa ggtgttgctg actcatacca ggcctgaatc gccccatcat 5280
ccagccagaa agtgagggag ccacggttga tgagagcttt gttgtaggtg gaccagttgg 5340
tgattttgaa cttttgcttt gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct 5400
gatccttcaa ctcagcaaaa gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag 5460
cgtaatgctc tgccagtgtt acaaccaatt aaccaattct gattagaaaa actcatcgag 5520
catcaaatga aactgcaatt tattcatatc aggattatca ataccatatt tttgaaaaag 5580
ccgtttctgt aatgaaggag aaaactcacc gaggcagttc cataggatgg caagatcctg 5640
gtatcggtct gcgattccga ctcgtccaac atcaatacaa cctattaatt tcccctcgtc 5700
aaaaataagg ttatcaagtg agaaatcacc atgagtgacg actgaatccg gtgagaatgg 5760
caaaagctta tgcatttctt tccagacttg ttcaacaggc cagccattac gctcgtcatc 5820
aaaatcactc gcatcaacca aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa 5880
tacgcgatcg ctgttaaaag gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa 5940
cactgccagc gcatcaacaa tattttcacc tgaatcagga tattcttcta atacctggaa 6000
tgctgttttc ccggggatcg cagtggtgag taaccatgca tcatcaggag tacggataaa 6060
atgcttgatg gtcggaagag gcataaattc cgtcagccag tttagtctga ccatctcatc 6120
tgtaacatca ttggcaacgc tacctttgcc atgtttcaga aacaactctg gcgcatcggg 6180
cttcccatac aatcgataga ttgtcgcacc tgattgcccg acattatcgc gagcccattt 6240
atacccatat aaatcagcat ccatgttgga atttaatcgc ggcctcgagc aagacgtttc 6300
ccgttgaata tggctcataa cacccttgt attactgttt atgtaagcag acagttttat 6360
tgttcatgat gatatatttt tatcttgtgc aatgtaacat cagagatttt gagacacaac 6420
gtggctttcc ccccccccc attattgaag catttatcag ggttattgtc tcatgagcgg 6480
atacatattt gaatgtattt agaaaaataa acaaataggg gttccgcgca catttccccg 6540
aaaagtgcca cctgacgtct aagaaaccat tattatcatg acattaacct ataaaaatag 6600
gcgtatcacg aggccctttc gtc 6623

<210> 99
<211> 6542
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 99
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960

tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccccc 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
gatcggccca ctgcaacatc agccgcaccg cctggaacaa gaccctgcag gaggtgggca 2700
agaagctggc cgagcacttc cccaacaagg ccatcaagtt cgccaagcac agcggcggcg 2760
acctggagat caccacccac agcttcaact gccgcggcga gttcttctac tgcaacacca 2820
gcagcctgtt caacagcacc tacaccccca acagcaccga gaacatcacc ggcaccgaga 2880
acagcatcat caccatcccc tgccgcatca agcagatcat caacatgtgg cagggcgtgg 2940
gccgcgccat gtacgccccc cccatcgagg gcatcctgac ctgccgcagc aacatcaccg 3000
gcctgctgct gacccgcgac ggcggcaccg gcatgcacga caccgagatc ttccgccccg 3060
agggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtggaga 3120
tcaagccccc gggcatcgcc cccaccaagg ccaagcttac cgtgcaggtg cgccagctgc 3180
tgagcggcat cgtgcagcag cagagcaacc tgctgcgcgc catcgaggcc cagcagcaca 3240
tgctgcagct gaccgtgtgg ggcatcaagc agctgcagac ccgcgtgctg gccatcgagc 3300
gctacctgcg cgaccagcag ctcgaggaca tctggaacaa catgacctgg atgcagtggg 3360
accgcgagat cagcaactac accaacacca tctaccgcct gctggaggac agccagaacc 3420
agcaggagaa gaacgagcag gacctgctgg ccctggacaa gtggcagaac ctgtggacct 3480
ggttcggcat caccaactgg ctgtggtgaa cacgtgggat ccagatctgc tgtgccttct 3540
agttgccagc catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc 3600
actcccactg tcctttcctа ataaaatgag gaaattgcat cgcattgtct gagtaggtgt 3660
cattctattc tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat 3720
agcaggcatg ctggggatgc ggtgggctct atgggtaccc aggtgctgaa gaattgaccc 3780
ggttcctcct gggccagaaa gaagcaggca catcccccttc tctgtgacac accctgtcca 3840
cgcccctggt tcttagttcc agccccactc ataggacact catagctcag gagggctccg 3900
ccttcaatcc cacccgctaa agtacttgga gcggtctctc cctccctcat cagcccacca 3960
aaccaaacct agcctccaag agtgggaaga aattaaagca agataggcta ttaagtgcag 4020
agggagagaa aatgcctcca acatgtgagg aagtaatgag agaaatcata gaattttaag 4080
gccatgattt aaggccatca tggccttaat cttccgcttc ctcgctcact gactcgctgc 4140
gctcggtcgt tcggctgcgg cgagcggtat cagctcactc aaaggcggta atacggttat 4200
ccacagaatc aggggataac gcaggaaaga acatgtgagc aaaaggccag caaaaggcca 4260

ggaaccgtaa aaaggccgcg ttgctggcgt ttttccatag gctccgcccc cctgacgagc 4320
atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc gacaggacta taaagatacc 4380
aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt tccgaccctg ccgcttaccg 4440
gatacctgtc cgcctttctc ccttcgggaa gcgtggcgct ttctcatagc tcacgctgta 4500
ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac gaaccccccg 4560
ttcagcccga ccgctgcgcc ttatccggta actatcgtct tgagtccaac ccggtaagac 4620
acgacttatc gccactggca gcagccactg gtaacaggat tagcagagcg aggtatgtag 4680
gcggtgctac agagttcttg aagtggtggc ctaactacgg ctacactaga agaacagtat 4740
ttggtatctg cgctctgctg aagccagtta ccttcggaaa aagagttggt agctcttgat 4800
ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag cagattacgc 4860
gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc tacggggtct gacgctcagt 4920
ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt atcaaaaagg atcttcacct 4980
agatcctttt aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaactt 5040
ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc tgtctatttc 5100
gttcatccat agttgcctga ctcgggggggg gggggcgctg aggtctgcct cgtgaagaag 5160
gtgttgctga ctcataccag gcctgaatcg ccccatcatc cagccagaaa gtgagggagc 5220
cacggttgat gagagctttg ttgtaggtgg accagttggt gattttgaac ttttgctttg 5280
ccacggaacg gtctgcgttg tcgggaagat gcgtgatctg atccttcaac tcagcaaaag 5340
ttcgatttat tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct gccagtgtta 5400
caaccaatta accaattctg attagaaaaa ctcatcgagc atcaaatgaa actgcaattt 5460
attcatatca ggattatcaa taccatattt ttgaaaaagc cgtttctgta atgaaggaga 5520
aaactcaccg aggcagttcc ataggatggc aagatcctgg tatcggtctg cgattccgac 5580
tcgtccaaca tcaatacaac ctattaattt cccctcgtca aaaataaggt tatcaagtga 5640
gaaatcacca tgagtgacga ctgaatccgg tgagaatggc aaaagcttat gcatttcttt 5700
ccagacttgt tcaacaggcc agccattacg ctcgtcatca aaatcactcg catcaaccaa 5760
accgttattc attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc tgttaaaagg 5820
acaattacaa acaggaatcg aatgcaaccg gcgcaggaac actgccagcg catcaacaat 5880
attttcacct gaatcaggat attcttctaa tacctggaat gctgttttcc cggggatcgc 5940
agtggtgagt aaccatgcat catcaggagt acggataaaa tgcttgatgg tcggaagagg 6000
cataaattcc gtcagccagt ttagtctgac catctcatct gtaacatcat tggcaacgct 6060
acctttgcca tgtttcagaa acaactctgg cgcatcgggc ttcccatata atcgatagat 6120
tgtcgcacct gattgcccga cattatcgcg agcccattta tacccatata aatcagcatc 6180
catgttggaa tttaatcgcg gcctcgagca agacgtttcc cgttgaatat ggctcataac 6240
acccttgta ttactgttta tgtaagcaga cagttttatt gttcatgatg atatatttt 6300
atcttgtgca atgtaacatc agagattttg agacacaacg tggctttccc ccccccccca 6360
ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg aatgtattta 6420
gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac ctgacgtcta 6480
agaaaccatt attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg 6540
tc 6542

<210> 100
<211> 6473
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 100
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240

ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccgct 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
gatcggccca ctgcaacatc agccgcaccg cctggaacaa gaccctgcag gaggtgggca 2700
agaagctggc cgagcacttc cccaacaagg ccatcaagtt cgccaagcac agcggcggcg 2760
acctggagat caccacccac agcttcaact gccgcggcga gttcttctac tgcaacaccc 2820
gatcgatccc ctgccgcatc aagcagatca tcaacatgtg gcagggcgtg ggccgcgcca 2880
tgtacgcccc ccccatcgag ggcatcctga cctgccgcag caacatcacc ggcctgctgc 2940
tgacccgcga cggcggcacc ggcatgcacg acaccgagat cttccgcccc gagggcggcg 3000
acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtggag atcaagcccc 3060
tgggcatcgc ccccaccaag gccaagctta ccgtgcaggt gcgccagctg ctgagcggca 3120
tcgtgcagca gcagagcaac ctgctgcgcg ccatcgaggc ccagcagcac atgctgcagc 3180
tgaccgtgtg gggcatcaag cagctgcaga cccgcgtgct ggccatcgag cgctacctgc 3240
gcgaccagca gctcgaggac atctggaaca acatgacctg gatgcagtgg gaccgcgaga 3300
tcagcaacta caccaacacc atctaccgcc tgctggagga cagccagaac cagcaggaga 3360
agaacgagca ggacctgctg gccctggaca agtggcagaa cctgtggacc tggttcggca 3420
tcaccaactg gctgtggtga acacgtggga tccagatctg ctgtgccttc tagttgccag 3480
ccatctgttg tttgcccctc ccccgtgcct tccttgaccc tggaaggtgc cactcccact 3540

gtcctttcct aataaaatga ggaaattgca tcgcattgtc tgagtaggtg tcattctatt 3600
ctgggggtg gggtggggca ggacagcaag ggggaggatt gggaagacaa tagcaggcat 3660
gctggggatg cggtgggctc tatgggtacc caggtgctga agaattgacc cggttcctcc 3720
tgggccagaa agaagcaggc acatcccctt ctctgtgaca caccctgtcc acgcccctgg 3780
ttcttagttc cagccccact cataggacac tcatagctca ggagggctcc gccttcaatc 3840
ccacccgcta aagtacttgg agcggtctct ccctccctca tcagcccacc aaaccaaacc 3900
tagcctccaa gagtgggaag aaattaaagc aagataggct attaagtgca gagggagaga 3960
aaatgcctcc aacatgtgag gaagtaatga gagaaatcat agaattttaa ggccatgatt 4020
taaggccatc atggccttaa tcttccgctt cctcgctcac tgactcgctg cgctcggtcg 4080
ttcggctgcg gcgagcggta tcagctcact caaaggcggt aatacggtta tccacagaat 4140
caggggataa cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta 4200
aaaaggccgc gttgctggcg tttttccata ggctccgccc ccctgacgag catcacaaaa 4260
atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgtttc 4320
cccctggaag ctccctcgtg cgctctcctg ttccgaccct gccgcttacc ggatacctgt 4380
ccgcctttct cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca 4440
gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc gttcagcccg 4500
accgctgcgc cttatccggt aactatcgtc ttgagtccaa cccggtaaga cacgacttat 4560
cgccactggc agcagccact ggtaacagga ttagcagagc gaggtatgta ggcggtgcta 4620
cagagttctt gaagtggtgg cctaactacg gctacactag aagaacagta tttggtatct 4680
gcgctctgct gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac 4740
aaaccaccgc tggtagcggt ggtttttttg tttgcaagca gcagattacg cgcagaaaaa 4800
aaggatctca agaagatcct ttgatctttt ctacggggtc tgacgctcag tggaacgaaa 4860
actcacgtta agggattttg gtcatgagat tatcaaaaag gatcttcacc tagatccttt 4920
taaattaaaa atgaagtttt aaatcaatct aaagtatata tgagtaaact tggtctgaca 4980
gttaccaatg cttaatcagt gaggcaccta tctcagcgat ctgtctattt cgttcatcca 5040
tagttgcctg actcgggggg gggggcgct gaggtctgcc tcgtgaagaa ggtgttgctg 5100
actcatacca ggcctgaatc gccccatcat ccagccagaa agtgagggag ccacggttga 5160
tgagagcttt gttgtaggtg gaccagttgg tgattttgaa cttttgcttt gccacggaac 5220
ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa ctcagcaaaa gttcgattta 5280
ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc tgccagtgtt acaaccaatt 5340
aaccaattct gattagaaaa actcatcgag catcaaatga aactgcaatt tattcatatc 5400
aggattatca ataccatatt tttgaaaaag ccgtttctgt aatgaaggag aaaactcacc 5460
gaggcagttc cataggatgg caagatcctg gtatcggtct gcgattccga ctcgtccaac 5520
atcaatacaa cctattaatt tcccctcgtc aaaaataagg ttatcaagtg agaaatcacc 5580
atgagtgacg actgaatccg gtgagaatgg caaaagctta tgcatttctt tccagacttg 5640
ttcaacaggc cagccattac gctcgtcatc aaaatcactc gcatcaacca aaccgttatt 5700
cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg ctgttaaaag gacaattaca 5760
aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc gcatcaacaa tattttcacc 5820
tgaatcagga tattcttcta atacctggaa tgctgttttc ccggggatcg cagtggtgag 5880
taaccatgca tcatcaggag tacggataaa atgcttgatg gtcggaagag gcataaattc 5940
cgtcagccag tttagtctga ccatctcatc tgtaacatca ttggcaacgc tacctttgcc 6000
atgtttcaga aacaactctg gcgcatcggg cttcccatac aatcgataga ttgtcgcacc 6060
tgattgcccg acattatcgc gagcccattt atacccatat aaatcagcat ccatgttgga 6120
atttaatcgc ggcctcgagc aagacgtttc ccgttgaata tggctcataa cacccttgt 6180
attactgttt atgtaagcag acagttttat tgttcatgat gatatatttt tatcttgtgc 6240
aatgtaacat cagagatttt gagacacaac gtggctttcc ccccccccc attattgaag 6300
catttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt agaaaaataa 6360
acaaataggg gttccgcgca catttccccg aaaagtgcca cctgacgtct aagaaaccat 6420
tattatcatg acattaacct ataaaaatag gcgtatcacg aggccctttc gtc 6473

<210> 101
<211> 6554
<212> DNA

<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 101
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccgct 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
ccaacaacaa cacccgcaag agcatccgca tcggcccggg ccaggccttc tacgccaccg 2700
gcgagatcat cggcgacatc cgccaggccc actgcaacat cagccgcacc gcctggaaca 2760
agaccctgca ggaggtgggc aagaagctgg ccgagcactt ccccaacaag gccatcaagt 2820
tcgccaagca cagcggcggc gacctggaga tcaccaccca cagcttcaac tgccgcggcg 2880
agttcttcta ctgcaacacc cgatcgatcc cctgccgcat caagcagatc atcaacatgt 2940

ggcagggcgt gggccgcgcc atgtacgccc cccccatcga gggcatcctg acctgccgca 3000
gcaacatcac cggcctgctg ctgacccgcg acggcggcac cggcatgcac gacaccgaga 3060
tcttccgccc cgagggcggc gacatgcgcg acaactggcg cagcgagctg tacaagtaca 3120
aggtggtgga gatcaagccc ctgggcatcg cccccaccaa ggccaagctt accgtgcagg 3180
tgcgccagct gctgagcggc atcgtgcagc agcagagcaa cctgctgcgc gccatcgagg 3240
cccagcagca catgctgcag ctgaccgtgt ggggcatcaa gcagctgcag acccgcgtgc 3300
tggccatcga gcgctacctg cgcgaccagc agctcgagga catctggaac aacatgacct 3360
ggatgcagtg ggaccgcgag atcagcaact acaccaacac catctaccgc ctgctggagg 3420
acagccagaa ccagcaggag aagaacgagc aggacctgct ggccctggac aagtggcaga 3480
acctgtggac ctggttcggc atcaccaact ggctgtggtg aacacgtggg atccagatct 3540
gctgtgcctt ctagttgcca gccatctgtt gtttgccccc cccccgtgcc ttccttgacc 3600
ctggaaggtg ccactcccac tgtcctttcc taataaaatg aggaaattgc atcgcattgt 3660
ctgagtaggt gtcattctat tctgggggggt ggggtggggc aggacagcaa gggggaggat 3720
tgggaagaca atagcaggca tgctggggat gcggtgggct ctatgggtac ccaggtgctg 3780
aagaattgac ccggttcctc ctgggccaga aagaagcagg cacatcccct tctctgtgac 3840
acaccctgtc cacgcccctg gttcttagtt ccagccccac tcataggaca ctcatagctc 3900
aggagggctc cgccttcaat cccacccgct aaagtacttg gagcggtctc tccctccctc 3960
atcagcccac caaaccaaac ctagcctcca agagtgggaa gaaattaaag caagataggc 4020
tattaagtgc agagggagag aaaatgcctc caacatgtga ggaagtaatg agagaaatca 4080
tagaatttta aggccatgat ttaaggccat catggcctta atcttccgct tcctcgctca 4140
ctgactcgct gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg 4200
taatacggtt atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc 4260
agcaaaaggc caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc 4320
cccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 4380
tataaagata ccaggcgttt cccccctggaa gctccctcgt gcgctctcct gttccgaccc 4440
tgccgcttac cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata 4500
gctcacgctg taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc 4560
acgaaccccc cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca 4620
acccggtaag acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag 4680
cgaggtatgt aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta 4740
gaagaacagt atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg 4800
gtagctcttg atccggcaaa caaaccaccg ctggtagcgg tggtttttt gtttgcaagc 4860
agcagattac gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt 4920
ctgacgctca gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa 4980
ggatcttcac ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat 5040
atgagtaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga 5100
tctgtctatt tcgttcatcc atagttgcct gactcggggg ggggggcgc tgaggtctgc 5160
ctcgtgaaga aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga 5220
aagtgaggga gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga 5280
acttttgctt tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca 5340
actcagcaaa agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct 5400
ctgccagtgt tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg 5460
aaactgcaat ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg 5520
taatgaagga gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc 5580
tgcgattccg actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag 5640
gttatcaagt gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt 5700
atgcatttct ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact 5760
cgcatcaacc aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc 5820
gctgttaaaa ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag 5880
cgcatcaaca atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt 5940
cccggggatc gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat 6000
ggtcggaaga ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc 6060
attggcaacg ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata 6120
caatcgatag attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata 6180
taaatcagca tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat 6240

atggctcata acacccctttg tattactgtt tatgtaagca gacagtttta ttgttcatga 6300
tgatatattt ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc 6360
ccccccccccc cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt 6420
tgaatgtatt tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc 6480
acctgacgtc taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac 6540
gaggcccttt cgtc 6554

<210> 102
<211> 6671
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 102
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220

tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccg atcggcccac tgcaacatca gccgcaccgc ctggaacaag accctgcagg 2820
aggtgggcaa gaagctggcc gagcacttcc ccaacaaggc catcaagttc gccaagcaca 2880
gcggcggcga cctggagatc accacccaca gcttcaactg ccgcggcgag ttcttctact 2940
gcaacaccag cagcctgttc aacagcacct acacccccaa cagcaccgag aacatcaccg 3000
gcaccgagaa cagcatcatc accatccccc gccgcatcaa gcagatcatc aacatgtggc 3060
agggcgtggg ccgcgccatg tacgcccccc ccatcgaggg catcctgacc tgccgcagca 3120
acatcaccgg cctgctgctg acccgcgacg gcggcaccgg catgcacgac accgagatct 3180
tccgccccga gggcggcgac atgcgcgaca actggcgcag cgagctgtac aagtacaagg 3240
tggtggagat caagcccctg ggcatcgccc ccaccaaggc caagcttacc gtgcaggtgc 3300
gccagctgct gagcggcatc gtgcagcagc agagcaacct gctgcgcgcc atcgaggccc 3360
agcagcacat gctgcagctg accgtgtggg gcatcaagca gctgcagacc cgcgtgctgg 3420
ccatcgagcg ctacctgcgc gaccagcagc tcgaggacat ctggaacaac atgacctgga 3480
tgcagtggga ccgcgagatc agcaactaca ccaacaccat ctaccgcctg ctggaggaca 3540
gccagaacca gcaggagaag aacgagcagg acctgctggc cctggacaag tggcagaacc 3600
tgtggacctg gttcggcatc accaactggc tgtggtgaac acgtgggatc cagatctgct 3660
gtgccttcta gttgccagcc atctgttgtt tgcccctccc ccgtgccttc cttgaccctg 3720
gaaggtgcca ctcccactgt cctttcctaa taaaatgagg aaattgcatc gcattgtctg 3780
agtaggtgtc attctattct gggggggtggg gtggggcagg acagcaaggg ggaggattgg 3840
gaagacaata gcaggcatgc tggggatgcg gtgggctcta tgggtaccca ggtgctgaag 3900
aattgacccg gttcctcctg ggccagaaag aagcaggcac atccccttct ctgtgacaca 3960
ccctgtccac gcccctggtt cttagttcca gccccactca taggacactc atagctcagg 4020
agggctccgc cttcaatccc acccgctaaa gtacttggag cggtctctcc ctccctcatc 4080
agcccaccaa accaaaccta gcctccaaga gtgggaagaa attaaagcaa gataggctat 4140
taagtgcaga gggagagaaa atgcctccaa catgtgagga agtaatgaga gaaatcatag 4200
aattttaagg ccatgattta aggccatcat ggccttaatc ttccgcttcc tcgctcactg 4260
actcgctgcg ctcggtcgtt cggctgcggc gagcggtatc agctcactca aaggcggtaa 4320
tacggttatc cacagaatca ggggataacg caggaaagaa catgtgagca aaaggccagc 4380
aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt tttccatagg ctccgccccc 4440
ctgacgagca tcacaaaaat cgacgctcaa gtcagaggtg gcgaaacccg acaggactat 4500
aaagatacca ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc 4560
cgcttaccgg atacctgtcc gcctttctcc cttcgggaag cgtggcgctt tctcatagct 4620
cacgctgtag gtatctcagt tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg 4680
aacccccccgt tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc 4740
cggtaagaca cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga 4800
ggtatgtagg cggtgctaca gagttcttga agtggtggcc taactacggc tacactagaa 4860
gaacagtatt tggtatctgc gctctgctga agccagttac cttcggaaaa agagttggta 4920
gctcttgatc cggcaaacaa accaccgctg gtagcggtgg ttttttttgtt tgcaagcagc 4980
agattacgcg cagaaaaaaa ggatctcaag aagatccttt gatcttttct acggggtctg 5040
acgctcagtg gaacgaaaac tcacgttaag ggattttggt catgagatta tcaaaaagga 5100
tcttcaccta gatcctttta aattaaaaat gaagttttaa atcaatctaa agtatatatg 5160
agtaaacttg gtctgacagt taccaatgct taatcagtga ggcacctatc tcagcgatct 5220
gtctatttcg ttcatccata gttgcctgac tcgggggggg ggggcgctga ggtctgcctc 5280
gtgaagaagg tgttgctgac tcataccagg cctgaatcgc cccatcatcc agccagaaag 5340
tgagggagcc acggttgatg agagctttgt tgtaggtgga ccagttggtg attttgaact 5400
tttgctttgc cacggaacgg tctgcgttgt cgggaagatg cgtgatctga tccttcaact 5460
cagcaaaagt tcgatttatt caacaaagcc gccgtcccgt caagtcagcg taatgctctg 5520

ccagtgttac aaccaattaa ccaattctga ttagaaaaac tcatcgagca tcaaatgaaa 5580
ctgcaattta ttcatatcag gattatcaat accatatttt tgaaaaagcc gtttctgtaa 5640
tgaaggagaa aactcaccga ggcagttcca taggatggca agatcctggt atcggtctgc 5700
gattccgact cgtccaacat caatacaacc tattaatttc ccctcgtcaa aaataaggtt 5760
atcaagtgag aaatcaccat gagtgacgac tgaatccggt gagaatggca aaagcttatg 5820
catttctttc cagacttgtt caacaggcca gccattacgc tcgtcatcaa aatcactcgc 5880
atcaaccaaa ccgttattca ttcgtgattg cgcctgagcg agacgaaata cgcgatcgct 5940
gttaaaagga caattacaaa caggaatcga atgcaaccgg cgcaggaaca ctgccagcgc 6000
atcaacaata ttttcacctg aatcaggata ttcttctaat acctggaatg ctgttttccc 6060
ggggatcgca gtggtgagta accatgcatc atcaggagta cggataaaat gcttgatggt 6120
cggaagaggc ataaattccg tcagccagtt tagtctgacc atctcatctg taacatcatt 6180
ggcaacgcta cctttgccat gtttcagaaa caactctggc gcatcgggct tcccatacaa 6240
tcgatagatt gtcgcacctg attgcccgac attatcgcga gcccatttat acccatataa 6300
atcagcatcc atgttggaat ttaatcgcgg cctcgagcaa gacgtttccc gttgaatatg 6360
gctcataaca ccccttgtat tactgtttat gtaagcagac agttttattg ttcatgatga 6420
tatattttta tcttgtgcaa tgtaacatca gagattttga gacacaacgt ggctttcccc 6480
ccccccccat tattgaagca tttatcaggg ttattgtctc atgagcggat acatatttga 6540
atgtatttag aaaaataaac aaataggggt tccgcgcaca tttccccgaa aagtgccacc 6600
tgacgtctaa gaaaccatta ttatcatgac attaacctat aaaaataggc gtatcacgag 6660
gccctttcgt c 6671

<210> 103
<211> 6602
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 103
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380

cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccg atcggcccac tgcaacatca gccgcaccgc ctggaacaag accctgcagg 2820
aggtgggcaa gaagctggcc gagcacttcc ccaacaaggc catcaagttc gccaagcaca 2880
gcggcggcga cctggagatc accacccaca gcttcaactg ccgcggcgag ttcttctact 2940
gcaacacccg atcgatcccc tgccgcatca agcagatcat caacatgtgg cagggcgtgg 3000
gccgcgccat gtacgccccc cccatcgagg gcatcctgac ctgccgcagc aacatcaccg 3060
gcctgctgct gacccgcgac ggcggcaccg gcatgcacga caccgagatc ttccgccccg 3120
agggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtggaga 3180
tcaagccccc gggcatcgcc cccaccaagg ccaagcttac cgtgcaggtg cgccagctgc 3240
tgagcggcat cgtgcagcag cagagcaacc tgctgcgcgc,catcgaggcc cagcagcaca 3300
tgctgcagct gaccgtgtgg ggcatcaagc agctgcagac ccgcgtgctg gccatcgagc 3360
gctacctgcg cgaccagcag ctcgaggaca tctggaacaa catgacctgg atgcagtggg 3420
accgcgagat cagcaactac accaacacca tctaccgcct gctggaggac agccagaacc 3480
agcaggagaa gaacgagcag gacctgctgg ccctggacaa gtggcagaac ctgtggacct 3540
ggttcggcat caccaactgg ctgtggtgaa cacgtgggat ccagatctgc tgtgccttct 3600
agttgccagc catctgttgt ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc 3660
actcccactg tcctttcctа ataaaatgag gaaattgcat cgcattgtct gagtaggtgt 3720
cattctattc tgggggggtgg ggtggggcag gacagcaagg gggaggattg ggaagacaat 3780
agcaggcatg ctggggatgc ggtgggctct atgggtaccc aggtgctgaa gaattgaccc 3840
ggttcctcct gggccagaaa gaagcaggca catcccccttc tctgtgacac accctgtcca 3900
cgcccctggt tcttagttcc agccccactc ataggacact catagctcag gagggctccg 3960
ccttcaatcc cacccgctaa agtacttgga gcggtctctc cctccctcat cagcccacca 4020
aaccaaacct agcctccaag agtgggaaga aattaaagca agataggcta ttaagtgcag 4080
agggagagaa aatgcctcca acatgtgagg aagtaatgag agaaatcata gaattttaag 4140
gccatgattt aaggccatca tggccttaat cttccgcttc ctcgctcact gactcgctgc 4200
gctcggtcgt tcggctgcgg cgagcggtat cagctcactc aaaggcggta atacggttat 4260
ccacagaatc aggggataac gcaggaaaga acatgtgagc aaaaggccag caaaaggcca 4320
ggaaccgtaa aaaggccgcg ttgctggcgt ttttccatag gctccgcccc cctgacgagc 4380
atcacaaaaa tcgacgctca agtcagaggt ggcgaaaccc gacaggacta taaagatacc 4440
aggcgtttcc ccctggaagc tccctcgtgc gctctcctgt tccgaccctg ccgcttaccg 4500
gatacctgtc cgcctttctc ccttcgggaa gcgtggcgct ttctcatagc tcacgctgta 4560
ggtatctcag ttcggtgtag gtcgttcgct ccaagctggg ctgtgtgcac gaaccccccg 4620
ttcagcccga ccgctgcgcc ttatccggta actatcgtct tgagtccaac ccggtaagac 4680

acgacttatc gccactggca gcagccactg gtaacaggat tagcagagcg aggtatgtag 4740
gcggtgctac agagttcttg aagtggtggc ctaactacgg ctacactaga agaacagtat 4800
ttggtatctg cgctctgctg aagccagtta ccttcggaaa aagagttggt agctcttgat 4860
ccggcaaaca aaccaccgct ggtagcggtg gtttttttgt ttgcaagcag cagattacgc 4920
gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc tacggggtct gacgctcagt 4980
ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt atcaaaaagg atcttcacct 5040
agatcctttt aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaactt 5100
ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc tgtctatttc 5160
gttcatccat agttgcctga ctcgggggg gggggcgctg aggtctgcct cgtgaagaag 5220
gtgttgctga ctcataccag gcctgaatcg ccccatcatc cagccagaaa gtgagggagc 5280
cacggttgat gagagctttg ttgtaggtgg accagttggt gattttgaac ttttgctttg 5340
ccacggaacg gtctgcgttg tcgggaagat gcgtgatctg atccttcaac tcagcaaaag 5400
ttcgatttat tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct gccagtgtta 5460
caaccaatta accaattctg attagaaaaa ctcatcgagc atcaaatgaa actgcaattt 5520
attcatatca ggattatcaa taccatattt ttgaaaaagc cgtttctgta atgaaggaga 5580
aaactcaccg aggcagttcc ataggatggc aagatcctgg tatcggtctg cgattccgac 5640
tcgtccaaca tcaatacaac ctattaattt cccctcgtca aaaataaggt tatcaagtga 5700
gaaatcacca tgagtgacga ctgaatccgg tgagaatggc aaaagcttat gcatttcttt 5760
ccagacttgt tcaacaggcc agccattacg ctcgtcatca aaatcactcg catcaaccaa 5820
accgttattc attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc tgttaaaagg 5880
acaattacaa acaggaatcg aatgcaaccg gcgcaggaac actgccagcg catcaacaat 5940
attttcacct gaatcaggat attcttctaa tacctggaat gctgttttcc cggggatcgc 6000
agtggtgagt aaccatgcat catcaggagt acggataaaa tgcttgatgg tcggaagagg 6060
cataaattcc gtcagccagt ttagtctgac catctcatct gtaacatcat tggcaacgct 6120
acctttgcca tgtttcagaa acaactctgg cgcatcgggc ttcccataca atcgatagat 6180
tgtcgcacct gattgcccga cattatcgcg agcccattta tacccatata aatcagcatc 6240
catgttggaa tttaatcgcg gcctcgagca agacgtttcc cgttgaatat ggctcataac 6300
acccttgta ttactgttta tgtaagcaga cagttttatt gttcatgatg atatattttt 6360
atcttgtgca atgtaacatc agagattttg agacacaacg tggctttccc ccccccccca 6420
ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg aatgtattta 6480
gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac ctgacgtcta 6540
agaaaccatt attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg 6600
tc 6602

<210> 104
<211> 6683
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 104
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600

tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccc caacaacaac acccgcaaga gcatccgcat cggccccggc caggccttct 2820
acgccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacatc agccgcaccg 2880
cctggaacaa gaccctgcag gaggtgggca agaagctggc cgagcacttc cccaacaagg 2940
ccatcaagtt cgccaagcac agcggcggcg acctggagat caccacccac agcttcaact 3000
gccgcggcga gttcttctac tgcaacaccc gatcgatccc ctgccgcatc aagcagatca 3060
tcaacatgtg gcagggcgtg ggccgcgcca tgtacgcccc ccccatcgag ggcatcctga 3120
cctgccgcag caacatcacc ggcctgctgc tgacccgcga cggcggcacc ggcatgcacg 3180
acaccgagat cttccgcccc gagggcggcg acatgcgcga caactggcgc agcgagctgt 3240
acaagtacaa ggtggtggag atcaagcccc tgggcatcgc ccccaccaag gccaagctta 3300
ccgtgcaggt gcgccagctg ctgagcggca tcgtgcagca gcagagcaac ctgctgcgcg 3360
ccatcgaggc ccagcagcac atgctgcagc tgaccgtgtg gggcatcaag cagctgcaga 3420
cccgcgtgct ggccatcgag cgctacctgc gcgaccagca gctcgaggac atctggaaca 3480
acatgacctg gatgcagtgg gaccgcgaga tcagcaacta caccaacacc atctaccgcc 3540
tgctggagga cagccagaac cagcaggaga agaacgagca ggacctgctg gccctggaca 3600
agtggcagaa cctgtggacc tggttcggca tcaccaactg gctgtggtga acacgtggga 3660
tccagatctg ctgtgccttc tagttgccag ccatctgttg tttgccctc ccccgtgcct 3720
tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca 3780
tcgcattgtc tgagtaggtg tcattctatt ctgggggggtg gggtggggca ggacagcaag 3840
ggggaggatt gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc 3900

caggtgctga agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt 3960
ctctgtgaca caccctgtcc acgcccctgg ttcttagttc cagccccact cataggacac 4020
tcatagctca ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct 4080
ccctccctca tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc 4140
aagataggct attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga 4200
gagaaatcat agaattttaa ggccatgatt taaggccatc atggccttaa tcttccgctt 4260
cctcgctcac tgactcgctg cgctcggtcg ttcggctgcg gcgagcggta tcagctcact 4320
caaaggcggt aatacggtta tccacagaat caggggataa cgcaggaaag aacatgtgag 4380
caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata 4440
ggctccgccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc 4500
cgacaggact ataaagatac caggcgtttc cccctggaag ctccctcgtg cgctctcctg 4560
ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc 4620
tttctcatag ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc tccaagctgg 4680
gctgtgtgca cgaacccccc gttcagcccg accgctgcgc cttatccggt aactatcgtc 4740
ttgagtccaa cccggtaaga cacgacttat cgccactggc agcagccact ggtaacagga 4800
ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtggtgg cctaactacg 4860
gctacactag aagaacagta tttggtatct gcgctctgct gaagccagtt accttcggaa 4920
aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggt ggtttttttg 4980
tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt 5040
ctacggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat 5100
tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct 5160
aaagtatata tgagtaaact tggtctgaca gttaccaatg cttaatcagt gaggcaccta 5220
tctcagcgat ctgtctattt cgttcatcca tagttgcctg actcgggggg gggggcgct 5280
gaggtctgcc tcgtgaagaa ggtgttgctg actcatacca ggcctgaatc gccccatcat 5340
ccagccagaa agtgagggag ccacggttga tgagagcttt gttgtaggtg gaccagttgg 5400
tgattttgaa cttttgcttt gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct 5460
gatccttcaa ctcagcaaaa gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag 5520
cgtaatgctc tgccagtgtt acaaccaatt aaccaattct gattagaaaa actcatcgag 5580
catcaaatga aactgcaatt tattcatatc aggattatca ataccatatt tttgaaaaag 5640
ccgtttctgt aatgaaggag aaaactcacc gaggcagttc cataggatgg caagatcctg 5700
gtatcggtct gcgattccga ctcgtccaac atcaatacaa cctattaatt tcccctcgtc 5760
aaaaataagg ttatcaagtg agaaatcacc atgagtgacg actgaatccg gtgagaatgg 5820
caaaagctta tgcatttctt tccagacttg ttcaacaggc agccattac gctcgtcatc 5880
aaaatcactc gcatcaacca aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa 5940
tacgcgatcg ctgttaaaag gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa 6000
cactgccagc gcatcaacaa tattttcacc tgaatcagga tattcttcta atacctggaa 6060
tgctgttttc ccggggatcg cagtggtgag taaccatgca tcatcaggag tacggataaa 6120
atgcttgatg gtcggaagag gcataaattc cgtcagccag tttagtctga ccatctcatc 6180
tgtaacatca ttggcaacgc tacctttgcc atgtttcaga aacaactctg gcgcatcggg 6240
cttcccatac aatcgataga ttgtcgcacc tgattgcccg acattatcgc gagcccattt 6300
atacccatat aaatcagcat ccatgttgga atttaatcgc ggcctcgagc aagacgtttc 6360
ccgttgaata tggctcataa caccccttgt attactgttt atgtaagcag acagttttat 6420
tgttcatgat gatatatttt tatcttgtgc aatgtaacat cagagatttt gagacacaac 6480
gtggctttcc ccccccccc attattgaag catttatcag ggttattgtc tcatgagcgg 6540
atacatattt gaatgtattt agaaaaataa acaaataggg gttccgcgca catttccccg 6600
aaaagtgcca cctgacgtct aagaaaccat tattatcatg acattaacct ataaaaatag 6660
gcgtatcacg aggccctttc gtc 6683

<210> 105
<211> 6605
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 105
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccgatcggc ccactgcaac atcagccgca ccgcctggaa caagaccctg caggaggtgg 2760
gcaagaagct ggccgagcac ttccccaaca aggccatcaa gttcgccaag cacagcggcg 2820
gcgacctgga gatcaccacc cacagcttca actgccgcgg cgagttcttc tactgcaaca 2880
ccagcagcct gttcaacagc acctacaccc ccaacagcac cgagaacatc accggcaccg 2940
agaacagcat catcaccatc ccctgccgca tcaagcagat catcaacatg tggcagggcg 3000
tgggccgcgc catgtacgcc ccccccatcg agggcatcct gacctgccgc agcaacatca 3060

ccggcctgct gctgacccgc gacggcggca ccggcatgca cgacaccgag atcttccgcc 3120
ccgagggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtgg 3180
agatcaagcc cctgggcatc gcccccacca aggccaagct taccgtgcag gtgcgccagc 3240
tgctgagcgg catcgtgcag cagcagagca acctgctgcg cgccatcgag gcccagcagc 3300
acatgctgca gctgaccgtg tggggcatca agcagctgca gacccgcgtg ctggccatcg 3360
agcgctacct gcgcgaccag cagctcgagg acatctggaa caacatgacc tggatgcagt 3420
gggaccgcga gatcagcaac tacaccaaca ccatctaccg cctgctggag gacagccaga 3480
accagcagga gaagaacgag caggacctgc tggccctgga caagtggcag aacctgtgga 3540
cctggttcgg catcaccaac tggctgtggt gaacacgtgg gatccagatc tgctgtgcct 3600
tctagttgcc agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt 3660
gccactccca ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg 3720
tgtcattcta ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac 3780
aatagcaggc atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga 3840
cccggttcct cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt 3900
ccacgccccc ggttcttagt tccagcccca ctcataggac actcatagct caggagggct 3960
ccgccttcaa tcccacccgc taaagtactt ggagcggtct ctccctccct catcagccca 4020
ccaaaccaaa cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg 4080
cagagggaga gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt 4140
aaggccatga tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc 4200
tgcgctcggt cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt 4260
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg 4320
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 4380
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 4440
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 4500
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 4560
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 4620
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 4680
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 4740
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag 4800
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 4860
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 4920
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 4980
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 5040
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 5100
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 5160
ttcgttcatc catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag 5220
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 5280
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 5340
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 5400
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 5460
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 5520
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 5580
agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 5640
gactcgtcca acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag 5700
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 5760
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 5820
caaaccgtta ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa 5880
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 5940
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat 6000
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 6060
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 6120
gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 6180
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 6240
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 6300
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 6360

tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc 6420
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 6480
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 6540
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 6600
tcgtc 6605

<210> 106
<211> 6605
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 106
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280

agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgccccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccgatcggc ccactgcaac atcagccgca ccgcctggaa caagaccctg caggaggtgg 2760
gcaagaagct ggccgagcac ttccccaaca aggccatcaa gttcgccaag cacagcggcg 2820
gcgacctgga gatcaccacc cacagcttca actgccgcgg cgagttcttc tactgcaaca 2880
ccagcagcct gttcaacagc acctacaccc ccaacagcac cgagaacatc accggcaccg 2940
agaacagcat catcaccatc ccctgccgca tcaagcagat catcaacatg tggcagggcg 3000
tgggccgcgc catgtacgcc ccccccatcg agggcatcct gacctgccgc agcaacatca 3060
ccggcctgct gctgacccgc gacggcggca ccggcatgca cgacaccgag atcttccgcc 3120
ccgagggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtgg 3180
agatcaagcc cctgggcatc gcccccacca aggccaagct taccgtgcag gtgcgccagc 3240
tgctgagcgg catcgtgcag cagcagagca acctgctgcg cgccatcgag gcccagcagc 3300
acatgctgca gctgaccgtg tggggcatca agcagctgca gacccgcgtg ctggccatcg 3360
agcgctacct gcgcgaccag cagctcgagg acatctggaa caacatgacc tggatgcagt 3420
gggaccgcga gatcagcaac tacaccaaca ccatctaccg cctgctggag gacagccaga 3480
accagcagga gaagaacgag caggacctgc tggccctgga caagtggcag aacctgtgga 3540
cctggttcgg catcaccaac tggctgtggt gaacacgtgg gatccagatc tgctgtgcct 3600
tctagttgcc agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt 3660
gccactccca ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg 3720
tgtcattcta ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac 3780
aatagcaggc atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga 3840
cccggttcct cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt 3900
ccacgccccc ggttcttagt tccagcccca ctcataggac actcatagct caggagggct 3960
ccgccttcaa tcccacccgc taaagtactt ggagcggtct ctccctccct catcagccca 4020
ccaaaccaaa cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg 4080
cagagggaga gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt 4140
aaggccatga tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc 4200
tgcgctcggt cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt 4260
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg 4320
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 4380
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 4440
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 4500
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 4560
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 4620
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 4680
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 4740
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag 4800
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 4860
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 4920
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 4980
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 5040
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 5100
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 5160
ttcgttcatc catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag 5220
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 5280
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 5340
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 5400
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 5460
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 5520
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 5580

agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 5640
gactcgtcca acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag 5700
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 5760
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 5820
caaaccgtta ttcattcgtg attgcgcctg agcgagacga atacgcgat cgctgttaaa 5880
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 5940
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat 6000
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 6060
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 6120
gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 6180
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 6240
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 6300
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 6360
tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc 6420
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 6480
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 6540
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 6600
tcgtc 6605

<210> 107
<211> 6536
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 107
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt ccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500

agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgccccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccgatcggc ccactgcaac atcagccgca ccgcctggaa caagaccctg caggaggtgg 2760
gcaagaagct ggccgagcac ttccccaaca aggccatcaa gttcgccaag cacagcggcg 2820
gcgacctgga gatcaccacc cacagcttca actgccgcgg cgagttcttc tactgcaaca 2880
cccgatcgat cccctgccgc atcaagcaga tcatcaacat gtggcagggc gtgggccgcg 2940
ccatgtacgc ccccccccatc gagggcatcc tgacctgccg cagcaacatc accggcctgc 3000
tgctgacccg cgacggcggc accggcatgc acgacaccga gatcttccgc cccgagggcg 3060
gcgacatgcg cgacaactgg cgcagcgagc tgtacaagta caaggtggtg gagatcaagc 3120
ccctgggcat cgcccccacc aaggccaagc ttaccgtgca ggtgcgccag ctgctgagcg 3180
gcatcgtgca gcagcagagc aacctgctgc gcgccatcga ggcccagcag cacatgctgc 3240
agctgaccgt gtggggcatc aagcagctgc agacccgcgt gctggccatc gagcgctacc 3300
tgcgcgacca gcagctcgag gacatctgga acaacatgac ctggatgcag tgggaccgcg 3360
agatcagcaa ctacaccaac accatctacc gcctgctgga ggacagccag aaccagcagg 3420
agaagaacga gcaggacctg ctggccctgg acaagtggca gaacctgtgg acctggttcg 3480
gcatcaccaa ctggctgtgg tgaacacgtg ggatccagat ctgctgtgcc ttctagttgc 3540
cagccatctg ttgtttgccc ctcccccgtg ccttccttga ccctggaagg tgccactccc 3600
actgtccttt cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct 3660
attctggggg gtggggtggg gcaggacagc aagggggagg attgggaaga caatagcagg 3720
catgctgggg atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc 3780
tcctgggcca gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc 3840
tggttcttag ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca 3900
atcccacccg ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa 3960
acctagcctc caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag 4020
agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg 4080
atttaaggcc atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg 4140
tcgttcggct gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag 4200
aatcagggga taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc 4260
gtaaaaaggc cgcgttgctg gcgttttcc ataggctccg ccccctgac gagcatcaca 4320
aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt 4380
ttccccctgg aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc 4440
tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc 4500
tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc 4560
ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact 4620
tatcgccact ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg 4680
ctacagagtt cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta 4740
tctgcgctct gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca 4800

aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa 4860
aaaaaggatc tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg 4920
aaaactcacg ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc 4980
ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg 5040
acagttacca atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat 5100
ccatagttgc ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg 5160
ctgactcata ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt 5220
tgatgagagc tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg 5280
aacggtctgc gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat 5340
ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca 5400
attaaccaat tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat 5460
atcaggatta tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc 5520
accgaggcag ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc 5580
aacatcaata caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc 5640
accatgagtg acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac 5700
ttgttcaaca ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt 5760
attcattcgt gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt 5820
acaaacagga atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc 5880
acctgaatca ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt 5940
gagtaaccat gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa 6000
ttccgtcagc cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt 6060
gccatgtttc agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc 6120
acctgattgc ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt 6180
ggaatttaat cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct 6240
tgtattactg tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg 6300
tgcaatgtaa catcagagat tttgagacac aacgtggctt tcccccccccc cccattattg 6360
aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa 6420
taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac 6480
cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6536

<210> 108
<211> 6617
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 108
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840

ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccccaacaa caacacccgc aagagcatcc gcatcggccc cggccaggcc ttctacgcca 2760
ccggcgagat catcggcgac atccgccagg cccactgcaa catcagccgc accgcctgga 2820
acaagaccct gcaggaggtg ggcaagaagc tggccgagca cttccccaac aaggccatca 2880
agttcgccaa gcacagcggc ggcgacctgg agatcaccac ccacagcttc aactgccgcg 2940
gcgagttctt ctactgcaac acccgatcga tcccctgccg catcaagcag atcatcaaca 3000
tgtggcaggg cgtgggccgc gccatgtacg ccccccccat cgagggcatc ctgacctgcc 3060
gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caccggcatg cacgacaccg 3120
agatcttccg ccccgagggc ggcgacatgc gcgacaactg gcgcagcgag ctgtacaagt 3180
acaaggtggt ggagatcaag cccctgggca tcgccccccac caaggccaag cttaccgtgc 3240
aggtgcgcca gctgctgagc ggcatcgtgc agcagcagag caacctgctg cgcgccatcg 3300
aggcccagca gcacatgctg cagctgaccg tgtggggcat caagcagctg cagacccgcg 3360
tgctggccat cgagcgctac ctgcgcgacc agcagctcga ggacatctgg aacaacatga 3420
cctggatgca gtgggaccgc gagatcagca actacaccaa caccatctac cgcctgctgg 3480
aggacagcca gaaccagcag gagaagaacg agcaggacct gctggccctg gacaagtggc 3540
agaacctgtg gacctggttc ggcatcacca actggctgtg gtgaacacgt gggatccaga 3600
tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctccccgt gccttccttg 3660
accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat 3720
tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caaggggag 3780
gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg 3840
ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt 3900
gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag 3960
ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc 4020
ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata 4080
ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa 4140

tcatagaatt ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc 4200
tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg 4260
cggtaatacg gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag 4320
gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc 4380
gccccccctga cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag 4440
gactataaag ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga 4500
ccctgccgct taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc 4560
atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg 4620
tgcacgaacc ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt 4680
ccaacccggt aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca 4740
gagcgaggta tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca 4800
ctagaagaac agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag 4860
ttggtagctc ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca 4920
agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg 4980
ggtctgacgc tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa 5040
aaaggatctt cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta 5100
tatatgagta aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag 5160
cgatctgtct atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc 5220
tgcctcgtga agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc 5280
agaaagtgag ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt 5340
tgaacttttg ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct 5400
tcaactcagc aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat 5460
gctctgccag tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa 5520
atgaaactgc aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt 5580
ctgtaatgaa ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg 5640
gtctgcgatt ccgactcgtc caacatcaat acaacctatt aatttccccc cgtcaaaaat 5700
aaggttatca agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag 5760
cttatgcatt tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc 5820
actcgcatca accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg 5880
atcgctgtta aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc 5940
cagcgcatca acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt 6000
tttcccgggg atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt 6060
gatggtcgga agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac 6120
atcattggca acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc 6180
atacaatcga tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc 6240
atataaatca gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg 6300
aatatggctc ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca 6360
tgatgatata tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct 6420
ttcccccccc ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat 6480
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 6540
gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat 6600
cacgaggccc tttcgtc 6617

<210> 109
<211> 6713
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 109
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60

cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gcccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cgatcggccc 2820
actgcaacat cagccgcacc gcctggaaca agaccctgca ggaggtgggc aagaagctgg 2880
ccgagcactt ccccaacaag gccatcaagt tcgccaagca cagcggcggc gacctggaga 2940
tcaccaccca cagcttcaac tgccgcggcg agttcttcta ctgcaacacc agcagcctgt 3000
tcaacagcac ctacaccccc aacagcaccg agaacatcac cggcaccgag aacagcatca 3060
tcaccatccc ctgccgcatc aagcagatca tcaacatgtg gcagggcgtg ggccgcgcca 3120
tgtacgcccc ccccatcgag ggcatcctga cctgccgcag caacatcacc ggcctgctgc 3180
tgacccgcga cggcggcacc ggcatgcacg acaccgagat cttccgcccc gagggcggcg 3240
acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtggag atcaagcccc 3300
tgggcatcgc ccccaccaag gccaagctta ccgtgcaggt gcgccagctg ctgagcggca 3360

tcgtgcagca gcagagcaac ctgctgcgcg ccatcgaggc ccagcagcac atgctgcagc 3420
tgaccgtgtg gggcatcaag cagctgcaga cccgcgtgct ggccatcgag cgctacctgc 3480
gcgaccagca gctcgaggac atctggaaca acatgacctg gatgcagtgg gaccgcgaga 3540
tcagcaacta caccaacacc atctaccgcc tgctggagga cagccagaac cagcaggaga 3600
agaacgagca ggacctgctg gccctggaca agtggcagaa cctgtggacc tggttcggca 3660
tcaccaactg gctgtggtga acacgtggga tccagatctg ctgtgccttc tagttgccag 3720
ccatctgttg tttgcccctc ccccgtgcct tccttgaccc tggaaggtgc cactcccact 3780
gtcctttcct aataaaatga ggaaattgca tcgcattgtc tgagtaggtg tcattctatt 3840
ctgggggtg gggtggggca ggacagcaag ggggaggatt gggaagacaa tagcaggcat 3900
gctggggatg cggtgggctc tatgggtacc caggtgctga agaattgacc cggttcctcc 3960
tgggccagaa agaagcaggc acatcccctt ctctgtgaca caccctgtcc acgcccctgg 4020
ttcttagttc cagccccact cataggacac tcatagctca ggagggctcc gccttcaatc 4080
ccacccgcta aagtacttgg agcggtctct ccctccctca tcagcccacc aaaccaaacc 4140
tagcctccaa gagtgggaag aaattaaagc aagataggct attaagtgca gagggagaga 4200
aaatgcctcc aacatgtgag gaagtaatga gagaaatcat agaattttaa ggccatgatt 4260
taaggccatc atggccttaa tcttccgctt cctcgctcac tgactcgctg cgctcggtcg 4320
ttcggctgcg gcgagcggta tcagctcact caaaggcggt aatacggtta tccacagaat 4380
caggggataa cgcaggaaag aacatgtgag caaaaggcca gcaaaaggcc aggaaccgta 4440
aaaaggccgc gttgctggcg tttttccata ggctccgccc ccctgacgag catcacaaaa 4500
atcgacgctc aagtcagagg tggcgaaacc cgacaggact ataaagatac caggcgtttc 4560
cccctggaag ctccctcgtg cgctctcctg ttccgaccct gccgcttacc ggatacctgt 4620
ccgccttttct cccttcggga agcgtggcgc tttctcatag ctcacgctgt aggtatctca 4680
gttcggtgta ggtcgttcgc tccaagctgg gctgtgtgca cgaaccccc gttcagcccg 4740
accgctgcgc cttatccggt aactatcgtc ttgagtccaa cccggtaaga cacgacttat 4800
cgccactggc agcagccact ggtaacagga ttagcagagc gaggtatgta ggcggtgcta 4860
cagagttctt gaagtggtgg cctaactacg gctacactag aagaacagta tttggtatct 4920
gcgctctgct gaagccagtt accttcggaa aaagagttgg tagctcttga tccggcaaac 4980
aaaccaccgc tggtagcggt ggtttttttg tttgcaagca gcagattacg cgcagaaaaa 5040
aaggatctca agaagatcct ttgatctttt ctacggggtc tgacgctcag tggaacgaaa 5100
actcacgtta agggattttg gtcatgagat tatcaaaaag gatcttcacc tagatccttt 5160
taaattaaaa atgaagtttt aaatcaatct aaagtatata tgagtaaact tggtctgaca 5220
gttaccaatg cttaatcagt gaggcaccta tctcagcgat ctgtctattt cgttcatcca 5280
tagttgcctg actcgggggg ggggggcgct gaggtctgcc tcgtgaagaa ggtgttgctg 5340
actcatacca ggcctgaatc gccccatcat ccagccagaa agtgagggag ccacggttga 5400
tgagagcttt gttgtaggtg gaccagttgg tgattttgaa cttttgcttt gccacggaac 5460
ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa ctcagcaaaa gttcgattta 5520
ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc tgccagtgtt acaaccaatt 5580
aaccaattct gattagaaaa actcatcgag catcaaatga aactgcaatt tattcatatc 5640
aggattatca ataccatatt tttgaaaaag ccgtttctgt aatgaaggag aaaactcacc 5700
gaggcagttc cataggatgg caagatcctg gtatcggtct gcgattccga ctcgtccaac 5760
atcaatacaa cctattaatt tcccctcgtc aaaaataagg ttatcaagtg agaaatcacc 5820
atgagtgacg actgaatccg gtgagaatgg caaaagctta tgcatttctt tccagacttg 5880
ttcaacaggc cagccattac gctcgtcatc aaaatcactc gcatcaacca aaccgttatt 5940
cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg ctgttaaaag gacaattaca 6000
aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc gcatcaacaa tattttcacc 6060
tgaatcagga tattcttcta atacctggaa tgctgttttc ccggggatcg cagtggtgag 6120
taaccatgca tcatcaggag tacggataaa atgcttgatg gtcggaagag gcataaattc 6180
cgtcagccag tttagtctga ccatctcatc tgtaacatca ttggcaacgc tacctttgcc 6240
atgtttcaga aacaactctg gcgcatcggg cttcccatac aatcgataga ttgtcgcacc 6300
tgattgcccg acattatcgc gagcccattt atacccatat aaatcagcat ccatgttgga 6360
atttaatcgc ggcctcgagc aagacgtttc ccgttgaata tggctcataa caccccttgt 6420
attactgttt atgtaagcag acagttttat tgttcatgat gatatatttt tatcttgtgc 6480
aatgtaacat cagagatttt gagacacaac gtggctttcc ccccccccc attattgaag 6540
catttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt agaaaaataa 6600
acaaataggg gttccgcgca catttccccg aaaagtgcca cctgacgtct aagaaaccat 6660

tattatcatg acattaacct ataaaaatag gcgtatcacg aggccctttc gtc 6713

<210> 110
<211> 6644
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 110
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520

cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gcccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cgatcggccc 2820
actgcaacat cagccgcacc gcctggaaca agaccctgca ggaggtgggc aagaagctgg 2880
ccgagcactt ccccaacaag gccatcaagt tcgccaagca cagcggcggc gacctggaga 2940
tcaccaccca cagcttcaac tgccgcggcg agttcttcta ctgcaacacc cgatcgatcc 3000
cctgccgcat caagcagatc atcaacatgt ggcagggcgt gggccgcgcc atgtacgccc 3060
cccccatcga gggcatcctg acctgccgca gcaacatcac cggcctgctg ctgacccgcg 3120
acggcggcac cggcatgcac gacaccgaga tcttccgccc cgagggcggc gacatgcgcg 3180
acaactggcg cagcgagctg tacaagtaca aggtggtgga gatcaagccc ctgggcatcg 3240
cccccaccaa ggccaagctt accgtgcagg tgcgccagct gctgagcggc atcgtgcagc 3300
agcagagcaa cctgctgcgc gccatcgagg cccagcagca catgctgcag ctgaccgtgt 3360
ggggcatcaa gcagctgcag acccgcgtgc tggccatcga gcgctacctg cgcgaccagc 3420
agctcgagga catctggaac aacatgacct ggatgcagtg ggaccgcgag atcagcaact 3480
acaccaacac catctaccgc ctgctggagg acagccagaa ccagcaggag aagaacgagc 3540
aggacctgct ggccctggac aagtggcaga acctgtggac ctggttcggc atcaccaact 3600
ggctgtggtg aacacgtggg atccagatct gctgtgcctt ctagttgcca gccatctgtt 3660
gtttgccccc cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc 3720
taataaaatg aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggggt 3780
ggggtggggc aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat 3840
gcggtgggct ctatgggtac ccaggtgctg aagaattgac ccggttcctc ctgggccaga 3900
aagaagcagg cacatccccct tctctgtgac acaccctgtc cacgcccctg gttcttagtt 3960
ccagccccac tcataggaca ctcatagctc aggagggctc cgccttcaat cccacccgct 4020
aaagtacttg gagcggtctc tccctccctc atcagcccac caaaccaaac ctagcctcca 4080
agagtgggaa gaaattaaag caagataggc tattaagtgc agagggagag aaaatgcctc 4140
caacatgtga ggaagtaatg agagaaatca tagaatttta aggccatgat ttaaggccat 4200
catggcctta atcttccgct tcctcgctca ctgactcgct gcgctcggtc gttcggctgc 4260
ggcgagcggt atcagctcac tcaaaggcgg taatacggtt atccacagaa tcaggggata 4320
acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc caggaaccgt aaaaaggccg 4380
cgttgctggc gtttttccat aggctccgcc cccctgacga gcatcacaaa aatcgacgct 4440
caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt ccccctggaa 4500
gctccctcgt gcgctctcct gttccgaccc tgccgcttac cggatacctg tccgcctttc 4560
tcccttcggg aagcgtggcg ctttctcata gctcacgctg taggtatctc agttcggtgt 4620
aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc gaccgctgcg 4680
ccttatccgg taactatcgt cttgagtcca acccggtaag acacgactta tcgccactgg 4740
cagcagccac tggtaacagg attagcagag cgaggtatgt aggcggtgct acagagttct 4800
tgaagtggtg gcctaactac ggctacacta gaagaacagt atttggtatc tgcgctctgc 4860
tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg 4920
ctggtagcgg tggttttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc 4980
aagaagatcc tttgatcttt tctacggggt ctgacgctca gtggaacgaa aactcacgtt 5040
aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac ctagatcctt ttaaattaaa 5100
aatgaagttt taaatcaatc taaagtatat atgagtaaac ttggtctgac agttaccaat 5160
gcttaatcag tgaggcacct atctcagcga tctgtctatt tcgttcatcc atagttgcct 5220
gactcggggg gggggggcgc tgaggtctgc ctcgtgaaga aggtgttgct gactcatacc 5280
aggcctgaat cgccccatca tccagccaga aagtgaggga gccacggttg atgagagctt 5340
tgttgtaggt ggaccagttg gtgattttga acttttgctt tgccacggaa cggtctgcgt 5400
tgtcgggaag atgcgtgatc tgatccttca actcagcaaa agttcgattt attcaacaaa 5460
gccgccgtcc cgtcaagtca gcgtaatgct ctgccagtgt tacaaccaat taaccaattc 5520
tgattagaaa aactcatcga gcatcaaatg aaactgcaat ttattcatat caggattatc 5580
aataccatat ttttgaaaaa gccgtttctg taatgaagga gaaaactcac cgaggcagtt 5640
ccataggatg gcaagatcct ggtatcggtc tgcgattccg actcgtccaa catcaataca 5700
acctattaat ttcccctcgt caaaaataag gttatcaagt gagaaatcac catgagtgac 5760
gactgaatcc ggtgagaatg gcaaaagctt atgcatttct ttccagactt gttcaacagg 5820

ccagccatta cgctcgtcat caaaatcact cgcatcaacc aaaccgttat tcattcgtga 5880
ttgcgcctga gcgagacgaa atacgcgatc gctgttaaaa ggacaattac aaacaggaat 5940
cgaatgcaac cggcgcagga acactgccag cgcatcaaca atattttcac ctgaatcagg 6000
atattcttct aatacctgga atgctgtttt cccggggatc gcagtggtga gtaaccatgc 6060
atcatcagga gtacggataa aatgcttgat ggtcggaaga ggcataaatt ccgtcagcca 6120
gtttagtctg accatctcat ctgtaacatc attggcaacg ctacctttgc catgtttcag 6180
aaacaactct ggcgcatcgg gcttcccata caatcgatag attgtcgcac ctgattgccc 6240
gacattatcg cgagcccatt tatacccata taaatcagca tccatgttgg aatttaatcg 6300
cggcctcgag caagacgttt cccgttgaat atggctcata acacccccttg tattactgtt 6360
tatgtaagca gacagtttta ttgttcatga tgatatattt ttatcttgtg caatgtaaca 6420
tcagagattt tgagacacaa cgtggctttc ccccccccccc cattattgaa gcatttatca 6480
gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata aacaaatagg 6540
ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc taagaaacca ttattatcat 6600
gacattaacc tataaaaata ggcgtatcac gaggcccttt cgtc 6644

<210> 111
<211> 6725
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 111
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2820
acacccgcaa gagcatccgc atcggccccg gccaggcctt ctacgccacc ggcgagatca 2880
tcggcgacat ccgccaggcc cactgcaaca tcagccgcac cgcctggaac aagaccctgc 2940
aggaggtggg caagaagctg gccgagcact tccccaacaa ggccatcaag ttcgccaagc 3000
acagcggcgg cgacctggag atcaccaccc acagcttcaa ctgccgcggc gagttcttct 3060
actgcaacac ccgatcgatc ccctgccgca tcaagcagat catcaacatg tggcagggcg 3120
tgggccgcgc catgtacgcc ccccccatcg agggcatcct gacctgccgc agcaacatca 3180
ccggcctgct gctgacccgc gacggcggca ccggcatgca cgacaccgag atcttccgcc 3240
ccgagggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtgg 3300
agatcaagcc cctgggcatc gcccccacca aggccaagct taccgtgcag gtgcgccagc 3360
tgctgagcgg catcgtgcag cagcagagca acctgctgcg cgccatcgag gcccagcagc 3420
acatgctgca gctgaccgtg tggggcatca agcagctgca gacccgcgtg ctggccatcg 3480
agcgctacct gcgcgaccag cagctcgagg acatctggaa caacatgacc tggatgcagt 3540
gggaccgcga gatcagcaac tacaccaaca ccatctaccg cctgctggag gacagccaga 3600
accagcagga gaagaacgag caggacctgc tggccctgga caagtggcag aacctgtgga 3660
cctggttcgg catcaccaac tggctgtggt gaacacgtgg gatccagatc tgctgtgcct 3720
tctagttgcc agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt 3780
gccactccca ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg 3840
tgtcattcta ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac 3900
aatagcaggc atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga 3960
cccggttcct cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt 4020
ccacgccccc ggttcttagt tccagcccca ctcataggac actcatagct caggagggct 4080
ccgccttcaa tcccacccgc taaagtactt ggagcggtct ctccctcccc catcagccca 4140
ccaaaccaaa cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg 4200
cagagggaga gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt 4260
aaggccatga tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc 4320
tgcgctcggt cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt 4380
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg 4440
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 4500
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 4560
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 4620
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 4680
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 4740
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 4800
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 4860
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag 4920
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 4980
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 5040

cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 5100
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 5160
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 5220
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 5280
ttcgttcatc catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag 5340
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 5400
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 5460
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 5520
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 5580
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 5640
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 5700
agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 5760
gactcgtcca acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag 5820
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 5880
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 5940
caaaccgtta ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa 6000
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 6060
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tccccggggat 6120
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 6180
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 6240
gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 6300
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 6360
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 6420
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 6480
tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc 6540
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 6600
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 6660
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 6720
tcgtc 6725

<210> 112
<211> 6824
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 112
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840

ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccc caacaacaac acccgcaaga gcatccgcat cggccccggc caggccttct 2820
acgccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacatc agccgcaccg 2880
cctggaacaa gaccctgcag gaggtgggca agaagctggc cgagcacttc cccaacaagg 2940
ccatcaagtt cgccaagcac agcggcggcg acctggagat caccacccac agcttcaact 3000
gccgcggcga gttcttctac tgcaacacca gcagcctgtt caacagcacc tacaccccca 3060
acagcaccga gaacatcacc ggcaccgaga acagcatcat caccatcccc tgccgcatca 3120
agcagatcat caacatgtgg cagggcgtgg gccgcgccat gtacgccccc cccatcgagg 3180
gcatcctgac ctgccgcagc aacatcaccg gcctgctgct gacccgcgac ggcggcaccg 3240
gcatgcacga caccgagatc ttccgccccg agggcggcga catgcgcgac aactggcgca 3300
gcgagctgta caagtacaag gtggtggaga tcaagccccc gggcatcgcc cccaccaagg 3360
ccaagcttac cgtgcaggtg cgccagctgc tgagcggcat cgtgcagcag cagagcaacc 3420
tgctgcgcgc catcgaggcc cagcagcaca tgctgcagct gaccgtgtgg ggcatcaagc 3480
agctgcagac ccgcgtgctg gccatcgagc gctacctgcg cgaccagcag ctcgaggaca 3540
tctggaacaa catgacctgg atgcagtggg accgcgagat cagcaactac accaacacca 3600
tctaccgcct gctggaggac agccagaacc agcaggagaa gaacgagcag gacctgctgg 3660
ccctggacaa gtggcagaac ctgtggacct ggttcggcat caccaactgg ctgtggtaca 3720
tcaagatctt catcaagatc gtgggcggcc tgatcggcct gcgcatcatc ttcgccgtgc 3780
tgagcatctg aacacgtggg atccagatct gctgtgcctt ctagttgcca gccatctgtt 3840
gtttgccccc cccccgtgcc ttccttgacc ctggaaggtg ccactcccac tgtcctttcc 3900
taataaaatg aggaaattgc atcgcattgt ctgagtaggt gtcattctat tctgggggggt 3960
ggggtggggc aggacagcaa gggggaggat tgggaagaca atagcaggca tgctggggat 4020
gcggtgggct ctatgggtac ccaggtgctg aagaattgac ccggttcctc ctgggccaga 4080
aagaagcagg cacatcccct tctctgtgac acaccctgtc cacgcccctg gttcttagtt 4140

```
ccagccccac tcataggaca ctcatagctc aggagggctc cgccttcaat cccacccgct 4200
aaagtacttg gagcggtctc tccctccctc atcagcccac caaaccaaac ctagcctcca 4260
agagtgggaa gaaattaaag caagataggc tattaagtgc agagggagag aaaatgcctc 4320
caacatgtga ggaagtaatg agagaaatca tagaatttta aggccatgat ttaaggccat 4380
catggcctta atcttccgct tcctcgctca ctgactcgct gcgctcggtc gttcggctgc 4440
ggcgagcggt atcagctcac tcaaaggcgg taatacggtt atccacagaa tcaggggata 4500
acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc caggaaccgt aaaaaggccg 4560
cgttgctggc gtttttccat aggctccgcc cccctgacga gcatcacaaa aatcgacgct 4620
caagtcagag gtggcgaaac ccgacaggac tataaagata ccaggcgttt cccccctggaa 4680
gctccctcgt gcgctctcct gttccgaccc tgccgcttac cggatacctg tccgcctttc 4740
tcccttcggg aagcgtggcg ctttctcata gctcacgctg taggtatctc agttcggtgt 4800
aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc cgttcagccc gaccgctgcg 4860
ccttatccgg taactatcgt cttgagtcca acccggtaag acacgactta tcgccactgg 4920
cagcagccac tggtaacagg attagcagag cgaggtatgt aggcggtgct acagagttct 4980
tgaagtggtg gcctaactac ggctacacta gaagaacagt atttggtatc tgcgctctgc 5040
tgaagccagt taccttcgga aaaagagttg gtagctcttg atccggcaaa caaaccaccg 5100
ctggtagcgg tggttttttt gtttgcaagc agcagattac gcgcagaaaa aaaggatctc 5160
aagaagatcc tttgatcttt tctacggggt ctgacgctca gtggaacgaa aactcacgtt 5220
aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac ctagatcctt ttaaattaaa 5280
aatgaagttt taaatcaatc taaagtatat atgagtaaac ttggtctgac agttaccaat 5340
gcttaatcag tgaggcacct atctcagcga tctgtctatt tcgttcatcc atagttgcct 5400
gactcggggg gggggggcgc tgaggtctgc ctcgtgaaga aggtgttgct gactcatacc 5460
aggcctgaat cgccccatca tccagccaga aagtgaggga gccacggttg atgagagctt 5520
tgttgtaggt ggaccagttg gtgattttga acttttgctt tgccacggaa cggtctgcgt 5580
tgtcgggaag atgcgtgatc tgatccttca actcagcaaa agttcgattt attcaacaaa 5640
gccgccgtcc cgtcaagtca gcgtaatgct ctgccagtgt tacaaccaat taaccaattc 5700
tgattagaaa aactcatcga gcatcaaatg aaactgcaat ttattcatat caggattatc 5760
aataccatat ttttgaaaaa gccgtttctg taatgaagga gaaaactcac cgaggcagtt 5820
ccataggatg gcaagatcct ggtatcggtc tgcgattccg actcgtccaa catcaataca 5880
acctattaat ttccccctcgt caaaaataag gttatcaagt gagaaatcac catgagtgac 5940
gactgaatcc ggtgagaatg gcaaaagctt atgcatttct ttccagactt gttcaacagg 6000
ccagccatta cgctcgtcat caaaatcact cgcatcaacc aaaccgttat tcattcgtga 6060
ttgcgcctga gcgagacgaa atacgcgatc gctgttaaaa ggacaattac aaacaggaat 6120
cgaatgcaac cggcgcagga acactgccag cgcatcaaca atattttcac ctgaatcagg 6180
atattcttct aatacctgga atgctgtttt cccggggatc gcagtggtga gtaaccatgc 6240
atcatcagga gtacggataa aatgcttgat ggtcggaaga ggcataaatt ccgtcagcca 6300
gtttagtctg accatctcat ctgtaacatc attggcaacg ctacctttgc catgtttcag 6360
aaacaactct ggcgcatcgg gcttcccata caatcgatag attgtcgcac ctgattgccc 6420
gacattatcg cgagcccatt tatacccata taaatcagca tccatgttgg aatttaatcg 6480
cggcctcgag caagacgttt cccgttgaat atggctcata acacccctttg tattactgtt 6540
tatgtaagca gacagtttta ttgttcatga tgatatattt ttatcttgtg caatgtaaca 6600
tcagagattt tgagacacaa cgtggctttc ccccccccc cattattgaa gcatttatca 6660
gggttattgt ctcatgagcg gatacatatt tgaatgtatt tagaaaaata aacaaatagg 6720
ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc taagaaacca ttattatcat 6780
gacattaacc tataaaaata ggcgtatcac gaggcccttt cgtc                  6824
```

<210> 113
<211> 6695
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 113
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccccc 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
ccaacaacaa cacccgcaag agcatccgca tcggccccgg ccaggccttc tacgccaccg 2700
gcgagatcat cggcgacatc cgccaggccc actgcaacat cagccgcacc gcctggaaca 2760
agaccctgca ggaggtgggc aagaagctgg ccgagcactt ccccaacaag gccatcaagt 2820
tcgccaagca cagcggcggc gacctggaga tcaccaccca cagcttcaac tgccgcggcg 2880
agttcttcta ctgcaacacc agcagcctgt tcaacagcac ctacaccccc aacagcaccg 2940
agaacatcac cggcaccgag aacagcatca tcaccatccc ctgccgcatc aagcagatca 3000
tcaacatgtg gcagggcgtg ggccgcgcca tgtacgcccc ccccatcgag ggcatcctga 3060
cctgccgcag caacatcacc ggcctgctgc tgacccgcga cggcggcacc ggcatgcacg 3120
acaccgagat cttccgcccc gagggcggcg acatgcgcga caactggcgc agcgagctgt 3180

acaagtacaa ggtggtggag atcaagcccc tgggcatcgc ccccaccaag gccaagctta 3240
ccgtgcaggt gcgccagctg ctgagcggca tcgtgcagca gcagagcaac ctgctgcgcg 3300
ccatcgaggc ccagcagcac atgctgcagc tgaccgtgtg gggcatcaag cagctgcaga 3360
cccgcgtgct ggccatcgag cgctacctgc gcgaccagca gctcgaggac atctggaaca 3420
acatgacctg gatgcagtgg gaccgcgaga tcagcaacta caccaacacc atctaccgcc 3480
tgctggagga cagccagaac cagcaggaga agaacgagca ggacctgctg gccctggaca 3540
agtggcagaa cctgtggacc tggttcggca tcaccaactg gctgtggtac atcaagatct 3600
tcatcaagat cgtgggcggc ctgatcggcc tgcgcatcat cttcgccgtg ctgagcatct 3660
gaacacgtgg gatccagatc tgctgtgcct tctagttgcc agccatctgt tgtttgcccc 3720
tcccccgtgc cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat 3780
gaggaaattg catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg 3840
caggacagca agggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc 3900
tctatgggta cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag 3960
gcacatcccc ttctctgtga cacaccctgt ccacgccccc ggttcttagt tccagcccca 4020
ctcataggac actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt 4080
ggagcggtct ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga 4140
agaaattaaa gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg 4200
aggaagtaat gagagaaatc atagaatttt aaggccatga tttaaggcca tcatggcctt 4260
aatcttccgc ttcctcgctc actgactcgc tgcgctcggt cgttcggctg cggcgagcgg 4320
tatcagctca ctcaaaggcg gtaatacggt tatccacaga atcaggggat aacgcaggaa 4380
agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc gcgttgctgg 4440
cgtttttcca taggctccgc ccccctgacg agcatcacaa aaatcgacgc tcaagtcaga 4500
ggtggcgaaa cccgacagga ctataaagat accaggcgtt tccccctgga agctccctcg 4560
tgcgctctcc tgttccgacc ctgccgctta ccggatacct gtccgccttt ctcccttcgg 4620
gaagcgtggc gctttctcat agctcacgct gtaggtatct cagttcggtg taggtcgttc 4680
gctccaagct gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc gccttatccg 4740
gtaactatcg tcttgagtcc aacccggtaa gacacgactt atcgccactg gcagcagcca 4800
ctggtaacag gattagcaga gcgaggtatg taggcggtgc tacagagttc ttgaagtggt 4860
ggcctaacta cggctacact agaagaacag tatttggtat ctgcgctctg ctgaagccag 4920
ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa acaaaccacc gctggtagcg 4980
gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct caagaagatc 5040
ctttgatctt ttctacgggg tctgacgctc agtggaacga aaactcacgt taagggattt 5100
tggtcatgag attatcaaaa aggatcttca cctagatcct tttaaattaa aaatgaagtt 5160
ttaaatcaat ctaaagtata tatgagtaaa cttggtctga cagttaccaa tgcttaatca 5220
gtgaggcacc tatctcagcg atctgtctat ttcgttcatc catagttgcc tgactcgggg 5280
gggggggcgg ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac caggcctgaa 5340
tcgccccatc atccagccag aaagtgaggg agccacggtt gatgagagct ttgttgtagg 5400
tggaccagtt ggtgattttg aacttttgct ttgccacgga acggtctgcg ttgtcgggaa 5460
gatgcgtgat ctgatccttc aactcagcaa aagttcgatt tattcaacaa agccgccgtc 5520
ccgtcaagtc agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt ctgattagaa 5580
aaactcatcg agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata 5640
tttttgaaaa agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat 5700
ggcaagatcc tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa 5760
tttcccctcg tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc 5820
cggtgagaat ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt 5880
acgctcgtca tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg 5940
agcgagacga aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcgaatgcaa 6000
ccggcgcagg aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc 6060
taatacctgg aatgctgttt tcccggggat cgcagtggtg agtaaccatg catcatcagg 6120
agtacggata aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct 6180
gaccatctca tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc 6240
tggcgcatcg ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc 6300
gcgagcccat ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga 6360
gcaagacgtt tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc 6420
agacagtttt attgttcatg atgatatatt tttatcttgt gcaatgtaac atcagagatt 6480

ttgagacaca acgtggcttt ccccccccc ccattattga agcatttatc agggttattg 6540
tctcatgagc ggatacatat ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg 6600
cacatttccc cgaaaagtgc cacctgacgt ctaagaaacc attattatca tgacattaac 6660
ctataaaaat aggcgtatca cgaggccctt tcgtc 6695

<210> 114
<211> 6614
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 114
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340

gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccccc 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
gatcggccca ctgcaacatc agccgcaccg cctggaacaa gaccctgcag gaggtgggca 2700
agaagctggc cgagcacttc cccaacaagg ccatcaagtt cgccaagcac agcggcggcg 2760
acctggagat caccacccac agcttcaact gccgcggcga gttcttctac tgcaacacca 2820
gcagcctgtt caacagcacc tacaccccca acagcaccga gaacatcacc ggcaccgaga 2880
acagcatcat caccatcccc tgccgcatca agcagatcat caacatgtgg cagggcgtgg 2940
gccgcgccat gtacgccccc cccatcgagg gcatcctgac ctgccgcagc aacatcaccg 3000
gcctgctgct gacccgcgac ggcggcaccg gcatgcacga caccgagatc ttccgccccg 3060
agggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtggaga 3120
tcaagccccc gggcatcgcc cccaccaagg ccaagcttac cgtgcaggtg cgccagctgc 3180
tgagcggcat cgtgcagcag cagagcaacc tgctgcgcgc catcgaggcc cagcagcaca 3240
tgctgcagct gaccgtgtgg ggcatcaagc agctgcagac ccgcgtgctg gccatcgagc 3300
gctacctgcg cgaccagcag ctcgaggaca tctggaacaa catgacctgg atgcagtggg 3360
accgcgagat cagcaactac accaacacca tctaccgcct gctggaggac agccagaacc 3420
agcaggagaa gaacgagcag gacctgctgg ccctggacaa gtggcagaac ctgtggacct 3480
ggttcggcat caccaactgg ctgtggtaca tcaagatctt catcaagatc gtgggcggcc 3540
tgatcggcct gcgcatcatc ttcgccgtgc tgagcatctg aacacgtggg atccagatct 3600
gctgtgcctt ctagttgcca gccatctgtt gtttgccccc cccccgtgcc ttccttgacc 3660
ctggaaggtg ccactcccac tgtcctttcc taataaaatg aggaaattgc atcgcattgt 3720
ctgagtaggt gtcattctat tctgggggggt ggggtggggc aggacagcaa gggggaggat 3780
tgggaagaca atagcaggca tgctggggat gcggtgggct ctatgggtac ccaggtgctg 3840
aagaattgac ccggttcctc ctgggccaga aagaagcagg cacatccccc tctctgtgac 3900
acaccctgtc cacgcccctg gttcttagtt ccagccccac tcataggaca ctcatagctc 3960
aggagggctc cgccttcaat cccacccgct aaagtacttg gagcggtctc tccctccctc 4020
atcagcccac caaaccaaac ctagcctcca agagtgggaa gaaattaaag caagataggc 4080
tattaagtgc agagggagag aaaatgcctc caacatgtga ggaagtaatg agagaaatca 4140
tagaatttta aggccatgat ttaaggccat catggcctta atcttccgct tcctcgctca 4200
ctgactcgct gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg 4260
taatacggtt atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc 4320
agcaaaaggc caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc 4380
cccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 4440
tataaagata ccaggcgttt ccccctggaa gctccctcgt gcgctctcct gttccgaccc 4500
tgccgcttac cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata 4560
gctcacgctg taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc 4620
acgaaccccc cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca 4680
acccggtaag acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag 4740
cgaggtatgt aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta 4800
gaagaacagt atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg 4860
gtagctcttg atccggcaaa caaaccaccg ctggtagcgg tggtttttt gtttgcaagc 4920
agcagattac gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt 4980
ctgacgctca gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa 5040
ggatcttcac ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat 5100
atgagtaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga 5160
tctgtctatt tcgttcatcc atagttgcct gactcggggg gggggggcgc tgaggtctgc 5220
ctcgtgaaga aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga 5280
aagtgaggga gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga 5340
acttttgctt tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca 5400
actcagcaaa agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct 5460
ctgccagtgt tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg 5520
aaactgcaat ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg 5580
taatgaagga gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc 5640

tgcgattccg actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag 5700
gttatcaagt gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt 5760
atgcatttct ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact 5820
cgcatcaacc aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc 5880
gctgttaaaa ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag 5940
cgcatcaaca atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt 6000
cccggggatc gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat 6060
ggtcggaaga ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc 6120
attggcaacg ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata 6180
caatcgatag attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata 6240
taaatcagca tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat 6300
atggctcata acaccccttg tattactgtt tatgtaagca gacagtttta ttgttcatga 6360
tgatatattt ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc 6420
ccccccccc cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt 6480
tgaatgtatt tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc 6540
acctgacgtc taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac 6600
gaggcccttt cgtc 6614

<210> 115
<211> 6545
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 115
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560

agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggccccc 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
gatcggccca ctgcaacatc agccgcaccg cctggaacaa gaccctgcag gaggtgggca 2700
agaagctggc cgagcacttc cccaacaagg ccatcaagtt cgccaagcac agcggcggcg 2760
acctggagat caccacccac agcttcaact gccgcggcga gttcttctac tgcaacaccc 2820
gatcgatccc ctgccgcatc aagcagatca tcaacatgtg gcagggcgtg ggccgcgcca 2880
tgtacgcccc ccccatcgag ggcatcctga cctgccgcag caacatcacc ggcctgctgc 2940
tgacccgcga cggcggcacc ggcatgcacg acaccgagat cttccgcccc gagggcggcg 3000
acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtggag atcaagcccc 3060
tgggcatcgc ccccaccaag gccaagctta ccgtgcaggt gcgccagctg ctgagcggca 3120
tcgtgcagca gcagagcaac ctgctgcgcg ccatcgaggc ccagcagcac atgctgcagc 3180
tgaccgtgtg gggcatcaag cagctgcaga cccgcgtgct ggccatcgag cgctacctgc 3240
gcgaccagca gctcgaggac atctggaaca acatgacctg gatgcagtgg gaccgcgaga 3300
tcagcaacta caccaacacc atctaccgcc tgctggagga cagccagaac cagcaggaga 3360
agaacgagca ggacctgctg gccctggaca agtggcagaa cctgtggacc tggttcggca 3420
tcaccaactg gctgtggtac atcaagatct tcatcaagat cgtgggcggc ctgatcggcc 3480
tgcgcatcat cttcgccgtg ctgagcatct gaacacgtgg gatccagatc tgctgtgcct 3540
tctagttgcc agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt 3600
gccactccca ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg 3660
tgtcattcta ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac 3720
aatagcaggc atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga 3780
cccggttcct cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt 3840
ccacgccccc ggttcttagt tccagcccca ctcataggac actcatagct caggagggct 3900
ccgccttcaa tcccacccgc taaagtactt ggagcggtct ctccctcccc catcagccca 3960
ccaaaccaaa cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg 4020
cagagggaga gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt 4080
aaggccatga tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc 4140
tgcgctcggt cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt 4200
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg 4260
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 4320
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 4380
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 4440
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 4500
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 4560
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 4620
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 4680
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag 4740
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 4800
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 4860

cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 4920
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 4980
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 5040
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 5100
ttcgttcatc catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag 5160
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 5220
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 5280
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 5340
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 5400
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 5460
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 5520
agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 5580
gactcgtcca acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag 5640
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 5700
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 5760
caaaccgtta ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa 5820
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 5880
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat 5940
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 6000
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 6060
gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 6120
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 6180
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 6240
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 6300
tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccc 6360
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 6420
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 6480
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 6540
tcgtc 6545

<210> 116
<211> 6626
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 116
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840

ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgatcaac tgcaacacca 2340
gcgccatcac ccaggcctgc cccaaggtga gcttcgaccc catccccatc cactactgcg 2400
cccccgccgg ctacgccatc ctgaagtgca acaacaagac cttcaacggc accggcccct 2460
gcaacaacgt gagcaccatc cagtgcaccc acggcaccaa gcccgtggtg agcacccagc 2520
tgctgctgaa cggcagcctg gccgaggagg agatcatcat ccgcagcaag aacctgaccg 2580
acaacgtgaa gaccatcatc gtgcacctga acgagagcgt ggagatcaac tgcacccgcc 2640
ccaacaacaa cacccgcaag agcatccgca tcggcccccgg ccaggccttc tacgccaccg 2700
gcgagatcat cggcgacatc cgccaggccc actgcaacat cagccgcacc gcctggaaca 2760
agaccctgca ggaggtgggc aagaagctgg ccgagcactt ccccaacaag gccatcaagt 2820
tcgccaagca cagcggcggc gacctggaga tcaccaccca cagcttcaac tgccgcggcg 2880
agttcttcta ctgcaacacc cgatcgatcc cctgccgcat caagcagatc atcaacatgt 2940
ggcagggcgt gggccgcgcc atgtacgccc cccccatcga gggcatcctg acctgccgca 3000
gcaacatcac cggcctgctg ctgacccgcg acggcggcac cggcatgcac gacaccgaga 3060
tcttccgccc cgagggcggc gacatgcgcg acaactggcg cagcgagctg tacaagtaca 3120
aggtggtgga gatcaagccc ctgggcatcg cccccaccaa ggccaagctt accgtgcagg 3180
tgcgccagct gctgagcggc atcgtgcagc agcagagcaa cctgctgcgc gccatcgagg 3240
cccagcagca catgctgcag ctgaccgtgt ggggcatcaa gcagctgcag acccgcgtgc 3300
tggccatcga gcgctacctg cgcgaccagc agctcgagga catctggaac aacatgacct 3360
ggatgcagtg ggaccgcgag atcagcaact acaccaacac catctaccgc ctgctggagg 3420
acagccagaa ccagcaggag aagaacgagc aggacctgct ggccctggac aagtggcaga 3480
acctgtggac ctggttcggc atcaccaact ggctgtggta catcaagatc ttcatcaaga 3540
tcgtgggcgg cctgatcggc ctgcgcatca tcttcgccgt gctgagcatc tgaacacgtg 3600
ggatccagat ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctccccgtg 3660
ccttccttga ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt 3720
gcatcgcatt gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc 3780
aagggggagg attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt 3840
acccaggtgc tgaagaattg acccggttcc tcctgggcca gaaagaagca ggcacatccc 3900
cttctctgtg acacaccctg tccacgcccc tggttcttag ttccagcccc actcatagga 3960
cactcatagc tcaggagggc tccgccttca atcccacccg ctaaagtact tggagcggtc 4020
tctccctccc tcatcagccc accaaaccaa acctagcctc caagagtggg aagaaattaa 4080
agcaagatag gctattaagt gcagagggag agaaaatgcc tccaacatgt gaggaagtaa 4140

tgagagaaat catagaattt taaggccatg atttaaggcc atcatggcct taatcttccg 4200
cttcctcgct cactgactcg ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc 4260
actcaaaggc ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt 4320
gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc 4380
ataggctccg ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa 4440
acccgacagg actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc 4500
ctgttccgac cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg 4560
cgctttctca tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc 4620
tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc 4680
gtcttgagtc caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca 4740
ggattagcag agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact 4800
acggctacac tagaagaaca gtatttggta tctgcgctct gctgaagcca gttaccttcg 4860
gaaaaagagt tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt 4920
ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct 4980
tttctacggg gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga 5040
gattatcaaa aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa 5100
tctaaagtat atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac 5160
ctatctcagc gatctgtcta tttcgttcat ccatagttgc ctgactcggg gggggggggc 5220
gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata ccaggcctga atcgccccat 5280
catccagcca gaaagtgagg gagccacggt tgatgagagc tttgttgtag gtggaccagt 5340
tggtgatttt gaacttttgc tttgccacgg aacggtctgc gttgtcggga agatgcgtga 5400
tctgatcctt caactcagca aaagttcgat ttattcaaca aagccgccgt cccgtcaagt 5460
cagcgtaatg ctctgccagt gttacaacca attaaccaat tctgattaga aaaactcatc 5520
gagcatcaaa tgaaactgca atttattcat atcaggatta tcaataccat atttttgaaa 5580
aagccgtttc tgtaatgaag gagaaaactc accgaggcag ttccatagga tggcaagatc 5640
ctggtatcgg tctgcgattc cgactcgtcc aacatcaata caacctatta atttcccctc 5700
gtcaaaaata aggttatcaa gtgagaaatc accatgagtg acgactgaat ccggtgagaa 5760
tggcaaaagc ttatgcattt ctttccagac ttgttcaaca ggccagccat tacgctcgtc 5820
atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt gattgcgcct gagcgagacg 5880
aaatacgcga tcgctgttaa aaggacaatt acaaacagga atcgaatgca accggcgcag 5940
gaacactgcc agcgcatcaa caatattttc acctgaatca ggatattctt ctaatacctg 6000
gaatgctgtt ttccccgggga tcgcagtggt gagtaaccat gcatcatcag gagtacggat 6060
aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc cagtttagtc tgaccatctc 6120
atctgtaaca tcattggcaa cgctaccttt gccatgtttc agaaacaact ctggcgcatc 6180
gggcttccca tacaatcgat agattgtcgc acctgattgc ccgacattat cgcgagccca 6240
tttataccca tataaatcag catccatgtt ggaatttaat cgcggcctcg agcaagacgt 6300
ttcccgttga atatggctca taacacccct tgtattactg tttatgtaag cagacagttt 6360
tattgttcat gatgatatat ttttatcttg tgcaatgtaa catcagagat tttgagacac 6420
aacgtggctt tcccccccccc cccattattg aagcatttat cagggttatt gtctcatgag 6480
cggatacata tttgaatgta tttagaaaaa taaacaaata ggggttccgc gcacatttcc 6540
ccgaaaagtg ccacctgacg tctaagaaac cattattatc atgacattaa cctataaaaa 6600
taggcgtatc acgaggccct ttcgtc 6626

<210> 117
<211> 6743
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 117
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60

cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccg atcggcccac tgcaacatca gccgcaccgc ctggaacaag accctgcagg 2820
aggtgggcaa gaagctggcc gagcacttcc ccaacaaggc catcaagttc gccaagcaca 2880
gcggcggcga cctggagatc accacccaca gcttcaactg ccgcggcgag ttcttctact 2940
gcaacaccag cagcctgttc aacagcacct acacccccaa cagcaccgag aacatcaccg 3000
gcaccgagaa cagcatcatc accatccgct gccgcatcaa gcagatcatc aacatgtggc 3060
agggcgtggg ccgcgccatg tacgcccccc ccatcgaggg catcctgacc tgccgcagca 3120
acatcaccgg cctgctgctg acccgcgacg gcggcaccgg catgcacgac accgagatct 3180
tccgccccga gggcggcgac atgcgcgaca actggcgcag cgagctgtac aagtacaagg 3240
tggtggagat caagcccctg ggcatcgccc ccaccaaggc caagcttacc gtgcaggtgc 3300
gccagctgct gagcggcatc gtgcagcagc agagcaacct gctgcgcgcc atcgaggccc 3360

agcagcacat gctgcagctg accgtgtggg gcatcaagca gctgcagacc cgcgtgctgg 3420
ccatcgagcg ctacctgcgc gaccagcagc tcgaggacat ctggaacaac atgacctgga 3480
tgcagtggga ccgcgagatc agcaactaca ccaacaccat ctaccgcctg ctggaggaca 3540
gccagaacca gcaggagaag aacgagcagg acctgctggc cctggacaag tggcagaacc 3600
tgtggacctg gttcggcatc accaactggc tgtggtacat caagatcttc atcaagatcg 3660
tgggcggcct gatcggcctg cgcatcatct tcgccgtgct gagcatctga acacgtggga 3720
tccagatctg ctgtgccttc tagttgccag ccatctgttg tttgcccctc ccccgtgcct 3780
tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca 3840
tcgcattgtc tgagtaggtg tcattctatt ctgggggggtg gggtggggca ggacagcaag 3900
ggggaggatt gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc 3960
caggtgctga agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt 4020
ctctgtgaca caccctgtcc acgcccctgg ttcttagttc cagccccact cataggacac 4080
tcatagctca ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct 4140
ccctccctca tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc 4200
aagataggct attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga 4260
gagaaatcat agaattttaa ggccatgatt taaggccatc atggccttaa tcttccgctt 4320
cctcgctcac tgactcgctg cgctcggtcg ttcggctgcg gcgagcggta tcagctcact 4380
caaaggcggt aatacggtta tccacagaat caggggataa cgcaggaaag aacatgtgag 4440
caaaaggcca gcaaaaggcc aggaaccgta aaaaggccgc gttgctggcg tttttccata 4500
ggctccgccc ccctgacgag catcacaaaa atcgacgctc aagtcagagg tggcgaaacc 4560
cgacaggact ataaagatac caggcgtttc cccctggaag ctccctcgtg cgctctcctg 4620
ttccgaccct gccgcttacc ggatacctgt ccgcctttct cccttcggga agcgtggcgc 4680
tttctcatag ctcacgctgt aggtatctca gttcggtgta ggtcgttcgc tccaagctgg 4740
gctgtgtgca cgaaccccc gttcagcccg accgctgcgc cttatccggt aactatcgtc 4800
ttgagtccaa cccggtaaga cacgacttat cgccactggc agcagccact ggtaacagga 4860
ttagcagagc gaggtatgta ggcggtgcta cagagttctt gaagtggtgg cctaactacg 4920
gctacactag aagaacagta tttggtatct gcgctctgct gaagccagtt accttcggaa 4980
aaagagttgg tagctcttga tccggcaaac aaaccaccgc tggtagcggt ggttttttg 5040
tttgcaagca gcagattacg cgcagaaaaa aaggatctca agaagatcct ttgatctttt 5100
ctacggggtc tgacgctcag tggaacgaaa actcacgtta agggattttg gtcatgagat 5160
tatcaaaaag gatcttcacc tagatccttt taaattaaaa atgaagtttt aaatcaatct 5220
aaagtatata tgagtaaact tggtctgaca gttaccaatg cttaatcagt gaggcaccta 5280
tctcagcgat ctgtctattt cgttcatcca tagttgcctg actcgggggg ggggggcgct 5340
gaggtctgcc tcgtgaagaa ggtgttgctg actcatacca ggcctgaatc gccccatcat 5400
ccagccagaa agtgagggag ccacggttga tgagagcttt gttgtaggtg gaccagttgg 5460
tgattttgaa cttttgcttt gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct 5520
gatccttcaa ctcagcaaaa gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag 5580
cgtaatgctc tgccagtgtt acaaccaatt aaccaattct gattagaaaa actcatcgag 5640
catcaaatga aactgcaatt tattcatatc aggattatca ataccatatt tttgaaaaag 5700
ccgtttctgt aatgaaggag aaaactcacc gaggcagttc cataggatgg caagatcctg 5760
gtatcggtct gcgattccga ctcgtccaac atcaatacaa cctattaatt tcccctcgtc 5820
aaaaataagg ttatcaagtg agaaatcacc atgagtgacg actgaatccg gtgagaatgg 5880
caaaagctta tgcatttctt tccagacttg ttcaacaggc cagccattac gctcgtcatc 5940
aaaatcactc gcatcaacca aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa 6000
tacgcgatcg ctgttaaaag gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa 6060
cactgccagc gcatcaacaa tattttcacc tgaatcagga tattcttcta atacctggaa 6120
tgctgttttc ccggggatcg cagtggtgag taaccatgca tcatcaggag tacggataaa 6180
atgcttgatg gtcggaagag gcataaattc cgtcagccag tttagtctga ccatctcatc 6240
tgtaacatca ttggcaacgc tacctttgcc atgtttcaga aacaactctg gcgcatcggg 6300
cttcccatac aatcgataga ttgtcgcacc tgattgcccg acattatcgc gagcccattt 6360
atacccatat aaatcagcat ccatgttgga atttaatcgc ggcctcgagc aagacgtttc 6420
ccgttgaata tggctcataa caccccttgt attactgttt atgtaagcag acagttttat 6480
tgttcatgat gatatatttt tatcttgtgc aatgtaacat cagagatttt gagacacaac 6540
gtggctttcc ccccccccc attattgaag catttatcag ggttattgtc tcatgagcgg 6600
atacatattt gaatgtattt agaaaaataa acaaataggg gttccgcgca catttccccg 6660

aaaagtgcca cctgacgtct aagaaaccat tattatcatg acattaacct ataaaaatag 6720
gcgtatcacg aggccctttc gtc 6743

<210> 118
<211> 6674
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 118
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460

gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccg atcggcccac tgcaacatca gccgcaccgc ctggaacaag accctgcagg 2820
aggtgggcaa gaagctggcc gagcacttcc ccaacaaggc catcaagttc gccaagcaca 2880
gcggcggcga cctggagatc accacccaca gcttcaactg ccgcggcgag ttcttctact 2940
gcaacacccg atcgatcccc tgccgcatca agcagatcat caacatgtgg cagggcgtgg 3000
gccgcgccat gtacgccccc cccatcgagg gcatcctgac ctgccgcagc aacatcaccg 3060
gcctgctgct gacccgcgac ggcggcaccg gcatgcacga caccgagatc ttccgccccg 3120
agggcggcga catgcgcgac aactggcgca gcgagctgta caagtacaag gtggtggaga 3180
tcaagccccc gggcatcgcc cccaccaagg ccaagcttac cgtgcaggtg cgccagctgc 3240
tgagcggcat cgtgcagcag cagagcaacc tgctgcgcgc catcgaggcc cagcagcaca 3300
tgctgcagct gaccgtgtgg ggcatcaagc agctgcagac ccgcgtgctg gccatcgagc 3360
gctacctgcg cgaccagcag ctcgaggaca tctggaacaa catgacctgg atgcagtggg 3420
accgcgagat cagcaactac accaacacca tctaccgcct gctggaggac agccagaacc 3480
agcaggagaa gaacgagcag gacctgctgg ccctggacaa gtggcagaac ctgtggacct 3540
ggttcggcat caccaactgg ctgtggtaca tcaagatctt catcaagatc gtgggcggcc 3600
tgatcggcct gcgcatcatc ttcgccgtgc tgagcatctg aacacgtggg atccagatct 3660
gctgtgcctt ctagttgcca gccatctgtt gtttgccccc cccccgtgcc ttccttgacc 3720
ctggaaggtg ccactcccac tgtcctttcc taataaaatg aggaaattgc atcgcattgt 3780
ctgagtaggt gtcattctat tctgggggggt ggggtggggc aggacagcaa gggggaggat 3840
tgggaagaca atagcaggca tgctggggat gcggtgggct ctatgggtac ccaggtgctg 3900
aagaattgac ccggttcctc ctgggccaga aagaagcagg cacatccccc tctctgtgac 3960
acaccctgtc cacgcccctg gttcttagtt ccagccccac tcataggaca ctcatagctc 4020
aggagggctc cgccttcaat cccacccgct aaagtacttg gagcggtctc tccctccctc 4080
atcagcccac caaaccaaac ctagcctcca agagtgggaa gaaattaaag caagataggc 4140
tattaagtgc agagggagag aaaatgcctc caacatgtga ggaagtaatg agagaaatca 4200
tagaatttta aggccatgat ttaaggccat catggcctta atcttccgct tcctcgctca 4260
ctgactcgct gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg 4320
taatacggtt atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc 4380
agcaaaaggc caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc 4440
cccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 4500
tataaagata ccaggcgttt ccccctggaa gctccctcgt gcgctctcct gttccgaccc 4560
tgccgcttac cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata 4620
gctcacgctg taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc 4680
acgaaccccc cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca 4740
acccggtaag acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag 4800
cgaggtatgt aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta 4860
gaagaacagt atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg 4920
gtagctcttg atccggcaaa caaaccaccg ctggtagcgg tggtttttt gtttgcaagc 4980
agcagattac gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt 5040
ctgacgctca gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa 5100
ggatcttcac ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat 5160
atgagtaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga 5220
tctgtctatt tcgttcatcc atagttgcct gactcggggg ggggggcgc tgaggtctgc 5280
ctcgtgaaga aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga 5340
aagtgaggga gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga 5400
acttttgctt tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca 5460
actcagcaaa agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct 5520
ctgccagtgt tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg 5580
aaactgcaat ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg 5640
taatgaagga gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc 5700
tgcgattccg actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag 5760

gttatcaagt gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt 5820
atgcatttct ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact 5880
cgcatcaacc aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc 5940
gctgttaaaa ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag 6000
cgcatcaaca atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt 6060
cccggggatc gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat 6120
ggtcggaaga ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc 6180
attggcaacg ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata 6240
caatcgatag attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata 6300
taaatcagca tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat 6360
atggctcata acaccccttg tattactgtt tatgtaagca gacagtttta ttgttcatga 6420
tgatatattt ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc 6480
ccccccccc cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt 6540
tgaatgtatt tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc 6600
acctgacgtc taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac 6660
gaggcccttt cgtc 6674

<210> 119
<211> 6755
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 119
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620

gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg atcgaagaac tgcagcttca 2340
acatgaccac cgaggtgcgc gacaagcgcg agaaggtgca cgccctgttc taccgcctgg 2400
acatcgtgcc cctgaagaac gagagcagca acaccagcgg cgactaccgc ctgatcaact 2460
gcaacaccag cgccatcacc caggcctgcc ccaaggtgag cttcgacccc atccccatcc 2520
actactgcgc ccccgccggc tacgccatcc tgaagtgcaa caacaagacc ttcaacggca 2580
ccggcccctg caacaacgtg agcaccatcc agtgcaccca cggcaccaag cccgtggtga 2640
gcacccagct gctgctgaac ggcagcctgg ccgaggagga gatcatcatc cgcagcaaga 2700
acctgaccga caacgtgaag accatcatcg tgcacctgaa cgagagcgtg gagatcaact 2760
gcacccgccc caacaacaac acccgcaaga gcatccgcat cggccccggc caggccttct 2820
acgccaccgg cgagatcatc ggcgacatcc gccaggccca ctgcaacatc agccgcaccg 2880
cctggaacaa gaccctgcag gaggtgggca agaagctggc cgagcacttc cccaacaagg 2940
ccatcaagtt cgccaagcac agcggcggcg acctggagat caccacccac agcttcaact 3000
gccgcggcga gttcttctac tgcaacaccc gatcgatccc ctgccgcatc aagcagatca 3060
tcaacatgtg gcagggcgtg ggccgcgcca tgtacgcccc ccccatcgag ggcatcctga 3120
cctgccgcag caacatcacc ggcctgctgc tgacccgcga cggcggcacc ggcatgcacg 3180
acaccgagat cttccgcccc gagggcggcg acatgcgcga caactggcgc agcgagctgt 3240
acaagtacaa ggtggtggag atcaagcccc tgggcatcgc ccccaccaag gccaagctta 3300
ccgtgcaggt gcgccagctg ctgagcggca tcgtgcagca gcagagcaac ctgctgcgcg 3360
ccatcgaggc ccagcagcac atgctgcagc tgaccgtgtg gggcatcaag cagctgcaga 3420
cccgcgtgct ggccatcgag cgctacctgc gcgaccagca gctcgaggac atctggaaca 3480
acatgacctg gatgcagtgg gaccgcgaga tcagcaacta caccaacacc atctaccgcc 3540
tgctggagga cagccagaac cagcaggaga agaacgagca ggacctgctg gccctggaca 3600
agtggcagaa cctgtggacc tggttcggca tcaccaactg gctgtggtac atcaagatct 3660
tcatcaagat cgtgggcggc ctgatcggcc tgcgcatcat cttcgccgtg ctgagcatct 3720
gaacacgtgg gatccagatc tgctgtgcct tctagttgcc agccatctgt tgtttgcccc 3780
tcccccgtgc cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat 3840
gaggaaattg catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg 3900
caggacagca agggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc 3960
tctatgggta cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag 4020
gcacatcccc ttctctgtga cacaccctgt ccacgccccc ggttcttagt tccagcccca 4080
ctcataggac actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt 4140
ggagcggtct ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga 4200
agaaattaaa gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg 4260
aggaagtaat gagagaaatc atagaatttt aaggccatga tttaaggcca tcatggcctt 4320
aatcttccgc ttcctcgctc actgactcgc tgcgctcggt cgttcggctg cggcgagcgg 4380
tatcagctca ctcaaaggcg gtaatacggt tatccacaga atcaggggat aacgcaggaa 4440
agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc gcgttgctgg 4500
cgtttttcca taggctccgc cccctgacg agcatcacaa aaatcgacgc tcaagtcaga 4560
ggtggcgaaa cccgacagga ctataaagat accaggcgtt tccccctgga agctccctcg 4620
tgcgctctcc tgttccgacc ctgccgctta ccggatacct gtccgccttt ctcccttcgg 4680
gaagcgtggc gctttctcat agctcacgct gtaggtatct cagttcggtg taggtcgttc 4740
gctccaagct gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc gccttatccg 4800
gtaactatcg tcttgagtcc aacccggtaa gacacgactt atcgccactg gcagcagcca 4860
ctggtaacag gattagcaga gcgaggtatg taggcggtgc tacagagttc ttgaagtggt 4920

ggcctaacta cggctacact agaagaacag tatttggtat ctgcgctctg ctgaagccag 4980
ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa acaaaccacc gctggtagcg 5040
gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct caagaagatc 5100
ctttgatctt ttctacgggg tctgacgctc agtggaacga aaactcacgt taagggattt 5160
tggtcatgag attatcaaaa aggatcttca cctagatcct tttaaattaa aaatgaagtt 5220
ttaaatcaat ctaaagtata tatgagtaaa cttggtctga cagttaccaa tgcttaatca 5280
gtgaggcacc tatctcagcg atctgtctat ttcgttcatc catagttgcc tgactcgggg 5340
gggggggcg ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac caggcctgaa 5400
tcgccccatc atccagccag aaagtgaggg agccacggtt gatgagagct ttgttgtagg 5460
tggaccagtt ggtgattttg aacttttgct ttgccacgga acggtctgcg ttgtcgggaa 5520
gatgcgtgat ctgatccttc aactcagcaa aagttcgatt tattcaacaa agccgccgtc 5580
ccgtcaagtc agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt ctgattagaa 5640
aaactcatcg agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata 5700
tttttgaaaa agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat 5760
ggcaagatcc tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa 5820
tttcccctcg tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc 5880
cggtgagaat ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt 5940
acgctcgtca tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg 6000
agcgagacga aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcgaatgcaa 6060
ccggcgcagg aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc 6120
taatacctgg aatgctgttt tccccggggat cgcagtggtg agtaaccatg catcatcagg 6180
agtacggata aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct 6240
gaccatctca tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc 6300
tggcgcatcg ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc 6360
gcgagcccat ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga 6420
gcaagacgtt tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc 6480
agacagtttt attgttcatg atgatatatt tttatcttgt gcaatgtaac atcagagatt 6540
ttgagacaca acgtggcttt ccccccccc ccattattga agcatttatc agggttattg 6600
tctcatgagc ggatacatat ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg 6660
cacatttccc cgaaaagtgc cacctgacgt ctaagaaacc attattatca tgacattaac 6720
ctataaaaat aggcgtatca cgaggccctt tcgtc 6755

<210> 120
<211> 6677
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 120
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720

catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgcccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccgatcggc ccactgcaac atcagccgca ccgcctggaa caagaccctg caggaggtgg 2760
gcaagaagct ggccgagcac ttccccaaca aggccatcaa gttcgccaag cacagcggcg 2820
gcgacctgga gatcaccacc cacagcttca actgccgcgg cgagttcttc tactgcaaca 2880
ccagcagcct gttcaacagc acctacaccc ccaacagcac cgagaacatc accggcaccg 2940
agaacagcat catcaccatc ccctgccgca tcaagcagat catcaacatg tggcagggcg 3000
tgggccgcgc catgtacgcc cccccatcg agggcatcct gacctgccgc agcaacatca 3060
ccggcctgct gctgacccgc gacggcggca ccggcatgca cgacaccgag atcttccgcc 3120
ccgagggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtgg 3180
agatcaagcc cctgggcatc gcccccacca aggccaagct taccgtgcag gtgcgccagc 3240
tgctgagcgg catcgtgcag cagcagagca acctgctgcg cgccatcgag gcccagcagc 3300
acatgctgca gctgaccgtg tggggcatca agcagctgca gacccgcgtg ctggccatcg 3360
agcgctacct gcgcgaccag cagctcgagg acatctggaa caacatgacc tggatgcagt 3420
gggaccgcga gatcagcaac tacaccaaca ccatctaccg cctgctggag gacagccaga 3480
accagcagga gaagaacgag caggacctgc tggccctgga caagtggcag aacctgtgga 3540
cctggttcgg catcaccaac tggctgtggt acatcaagat cttcatcaag atcgtgggcg 3600
gcctgatcgg cctgcgcatc atcttcgccg tgctgagcat ctgaacacgt gggatccaga 3660
tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctccccccgt gccttccttg 3720
accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat 3780
tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caaggggaag 3840
gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg 3900
ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt 3960
gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag 4020

```
ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc 4080
ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata 4140
ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa 4200
tcatagaatt ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc 4260
tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg 4320
cggtaatacg gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag 4380
gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc 4440
gccccccctga cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag 4500
gactataaag ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga 4560
ccctgccgct taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc 4620
atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg 4680
tgcacgaacc ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt 4740
ccaacccggt aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca 4800
gagcgaggta tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca 4860
ctagaagaac agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag 4920
ttggtagctc ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca 4980
agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg 5040
ggtctgacgc tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa 5100
aaaggatctt cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta 5160
tatatgagta aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag 5220
cgatctgtct atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc 5280
tgcctcgtga agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc 5340
agaaagtgag ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt 5400
tgaacttttg ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct 5460
tcaactcagc aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat 5520
gctctgccag tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa 5580
atgaaactgc aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt 5640
ctgtaatgaa ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg 5700
gtctgcgatt ccgactcgtc caacatcaat acaacctatt aatttcccct cgtcaaaaat 5760
aaggttatca agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag 5820
cttatgcatt tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc 5880
actcgcatca accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg 5940
atcgctgtta aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc 6000
cagcgcatca acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt 6060
tttccgggg atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt 6120
gatggtcgga agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac 6180
atcattggca acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc 6240
atacaatcga tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc 6300
atataaatca gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg 6360
aatatggctc ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca 6420
tgatgatata tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct 6480
ttcccccccc ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat 6540
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 6600
gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat 6660
cacgaggccc tttcgtc                                              6677
```

<210> 121
<211> 6677
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 121
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgcccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccgatcggc ccactgcaac atcagccgca ccgcctggaa caagaccctg caggaggtgg 2760
gcaagaagct ggccgagcac ttccccaaca aggccatcaa gttcgccaag cacagcggcg 2820
gcgacctgga gatcaccacc cacagcttca actgccgcgg cgagttcttc tactgcaaca 2880
ccagcagcct gttcaacagc acctacaccc ccaacagcac cgagaacatc accggcaccg 2940
agaacagcat catcaccatc ccctgccgca tcaagcagat catcaacatg tggcagggcg 3000
tgggccgcgc catgtacgcc ccccccatcg agggcatcct gacctgccgc agcaacatca 3060
ccggcctgct gctgacccgc gacggcggca ccggcatgca cgacaccgag atcttccgcc 3120
ccgagggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtgg 3180

agatcaagcc cctgggcatc gcccccacca aggccaagct taccgtgcag gtgcgccagc 3240
tgctgagcgg catcgtgcag cagcagagca acctgctgcg cgccatcgag gcccagcagc 3300
acatgctgca gctgaccgtg tggggcatca agcagctgca gacccgcgtg ctggccatcg 3360
agcgctacct gcgcgaccag cagctcgagg acatctggaa caacatgacc tggatgcagt 3420
gggaccgcga gatcagcaac tacaccaaca ccatctaccg cctgctggag gacagccaga 3480
accagcagga gaagaacgag caggacctgc tggccctgga caagtggcag aacctgtgga 3540
cctggttcgg catcaccaac tggctgtggt acatcaagat cttcatcaag atcgtgggcg 3600
gcctgatcgg cctgcgcatc atcttcgccg tgctgagcat ctgaacacgt gggatccaga 3660
tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg 3720
accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat 3780
tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag 3840
gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg 3900
ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt 3960
gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag 4020
ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc 4080
ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata 4140
ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa 4200
tcatagaatt ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc 4260
tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg 4320
cggtaatacg gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag 4380
gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc 4440
gcccccctga cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag 4500
gactataaag ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga 4560
ccctgccgct taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc 4620
atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg 4680
tgcacgaacc ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt 4740
ccaacccggt aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca 4800
gagcgaggta tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca 4860
ctagaagaac agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag 4920
ttggtagctc ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca 4980
agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg 5040
ggtctgacgc tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa 5100
aaaggatctt cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta 5160
tatatgagta aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag 5220
cgatctgtct atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc 5280
tgcctcgtga agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc 5340
agaaagtgag ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt 5400
tgaacttttg ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct 5460
tcaactcagc aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat 5520
gctctgccag tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa 5580
atgaaactgc aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt 5640
ctgtaatgaa ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg 5700
gtctgcgatt ccgactcgtc caacatcaat acaacctatt aatttccgct cgtcaaaaat 5760
aaggttatca agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag 5820
cttatgcatt tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc 5880
actcgcatca accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg 5940
atcgctgtta aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc 6000
cagcgcatca acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt 6060
tttcccgggg atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt 6120
gatggtcgga agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac 6180
atcattggca acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc 6240
atacaatcga tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc 6300
atataaatca gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg 6360
aatatggctc ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca 6420
tgatgatata tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct 6480

ttccccccc ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat 6540
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 6600
gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat 6660
cacgaggccc tttcgtc 6677

<210> 122
<211> 6608
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 122
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340

gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgccccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccgatcggc ccactgcaac atcagccgca ccgcctggaa caagaccctg caggaggtgg 2760
gcaagaagct ggccgagcac ttccccaaca aggccatcaa gttcgccaag cacagcggcg 2820
gcgacctgga gatcaccacc cacagcttca actgccgcgg cgagttcttc tactgcaaca 2880
cccgatcgat cccctgccgc atcaagcaga tcatcaacat gtggcagggc gtgggccgcg 2940
ccatgtacgc ccccccccatc gagggcatcc tgacctgccg cagcaacatc accggcctgc 3000
tgctgacccg cgacggcggc accggcatgc acgacaccga gatcttccgc cccgagggcg 3060
gcgacatgcg cgacaactgg cgcagcgagc tgtacaagta caaggtggtg gagatcaagc 3120
ccctgggcat cgcccccacc aaggccaagc ttaccgtgca ggtgcgccag ctgctgagcg 3180
gcatcgtgca gcagcagagc aacctgctgc gcgccatcga ggcccagcag cacatgctgc 3240
agctgaccgt gtggggcatc aagcagctgc agacccgcgt gctggccatc gagcgctacc 3300
tgcgcgacca gcagctcgag gacatctgga acaacatgac ctggatgcag tgggaccgcg 3360
agatcagcaa ctacaccaac accatctacc gcctgctgga ggacagccag aaccagcagg 3420
agaagaacga gcaggacctg ctggccctgg acaagtggca gaacctgtgg acctggttcg 3480
gcatcaccaa ctggctgtgg tacatcaaga tcttcatcaa gatcgtgggc ggcctgatcg 3540
gcctgcgcat catcttcgcc gtgctgagca tctgaacacg tgggatccag atctgctgtg 3600
ccttctagtt gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa 3660
ggtgccactc ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt 3720
aggtgtcatt ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa 3780
gacaatagca ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat 3840
tgacccggtt cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc 3900
tgtccacgcc cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg 3960
gctccgcctt caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc 4020
ccaccaaacc aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa 4080
gtgcagaggg agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat 4140
tttaaggcca tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact 4200
cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac 4260
ggttatccac agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa 4320
aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg 4380
acgagcatca caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa 4440
gataccaggc gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc 4500
ttaccggata cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac 4560
gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac 4620
ccccgttca gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg 4680
taagacacga cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt 4740
atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa 4800
cagtatttgg tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct 4860
cttgatccgg caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga 4920
ttacgcgcag aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg 4980
ctcagtggaa cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct 5040
tcacctagat ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt 5100
aaacttggtc tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc 5160
tatttcgttc atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg 5220
aagaaggtgt tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga 5280
gggagccacg gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt 5340
gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag 5400
caaaagttcg atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca 5460
gtgttacaac caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg 5520
caatttattc atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga 5580
aggagaaaac tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat 5640

tccgactcgt ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc 5700
aagtgagaaa tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat 5760
ttctttccag acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc 5820
aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt 5880
aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc 5940
aacaatattt tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg 6000
gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg 6060
aagaggcata aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc 6120
aacgctacct ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg 6180
atagattgtc gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc 6240
agcatccatg ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct 6300
cataacaccc cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat 6360
atttttatct tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc 6420
cccccattat tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg 6480
tatttagaaa aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga 6540
cgtctaagaa accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc 6600
ctttcgtc 6608

<210> 123
<211> 6689
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 123
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560

agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt ccgatcgatc aactgcaaca 2400
ccagcgccat cacccaggcc tgccccaagg tgagcttcga ccccatcccc atccactact 2460
gcgccccccgc cggctacgcc atcctgaagt gcaacaacaa gaccttcaac ggcaccggcc 2520
cctgcaacaa cgtgagcacc atccagtgca cccacggcac caagcccgtg gtgagcaccc 2580
agctgctgct gaacggcagc ctggccgagg aggagatcat catccgcagc aagaacctga 2640
ccgacaacgt gaagaccatc atcgtgcacc tgaacgagag cgtggagatc aactgcaccc 2700
gccccaacaa caacacccgc aagagcatcc gcatcggccc cggccaggcc ttctacgcca 2760
ccggcgagat catcggcgac atccgccagg cccactgcaa catcagccgc accgcctgga 2820
acaagaccct gcaggaggtg ggcaagaagc tggccgagca cttccccaac aaggccatca 2880
agttcgccaa gcacagcggc ggcgacctgg agatcaccac ccacagcttc aactgccgcg 2940
gcgagttctt ctactgcaac acccgatcga tcccctgccg catcaagcag atcatcaaca 3000
tgtggcaggg cgtgggccgc gccatgtacg ccccccccat cgagggcatc ctgacctgcc 3060
gcagcaacat caccggcctg ctgctgaccc gcgacggcgg caccggcatg cacgacaccg 3120
agatcttccg ccccgagggc ggcgacatgc gcgacaactg gcgcagcgag ctgtacaagt 3180
acaaggtggt ggagatcaag cccctgggca tcgcccccac caaggccaag cttaccgtgc 3240
aggtgcgcca gctgctgagc ggcatcgtgc agcagcagag caacctgctg cgcgccatcg 3300
aggcccagca gcacatgctg cagctgaccg tgtggggcat caagcagctg cagacccgcg 3360
tgctggccat cgagcgctac ctgcgcgacc agcagctcga ggacatctgg aacaacatga 3420
cctggatgca gtgggaccgc gagatcagca actacaccaa caccatctac cgcctgctgg 3480
aggacagcca gaaccagcag gagaagaacg agcaggacct gctggccctg gacaagtggc 3540
agaacctgtg gacctggttc ggcatcacca actggctgtg gtacatcaag atcttcatca 3600
agatcgtggg cggcctgatc ggcctgcgca tcatcttcgc cgtgctgagc atctgaacac 3660
gtgggatcca gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc 3720
gtgccttcct tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa 3780
attgcatcgc attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac 3840
agcaaggggg aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg 3900
ggtacccagg tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat 3960
ccccttctct gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata 4020
ggacactcat agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg 4080
gtctctccct ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat 4140
taaagcaaga taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag 4200
taatgagaga aatcatagaa ttttaaggcc atgatttaag gccatcatgg ccttaatctt 4260
ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag 4320
ctcactcaaa ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca 4380
tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt 4440
tccataggct ccgccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc 4500
gaaacccgac aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct 4560
ctcctgttcc gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg 4620
tggcgctttc tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca 4680
agctgggctg tgtgcacgaa ccccccgttc agcccgaccg ctgcgccttа tccggtaact 4740
atcgtcttga gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta 4800
acaggattag cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta 4860

actacggcta cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct 4920
tcggaaaaag agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt 4980
tttttgtttg caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga 5040
tcttttctac ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca 5100
tgagattatc aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat 5160
caatctaaag tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg 5220
cacctatctc agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag 5280
ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc 5340
catcatccag ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc 5400
agttggtgat tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg 5460
tgatctgatc cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca 5520
agtcagcgta atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc 5580
atcgagcatc aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg 5640
aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag 5700
atcctggtat cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc 5760
ctcgtcaaaa ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga 5820
gaatggcaaa agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc 5880
gtcatcaaaa tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag 5940
acgaaatacg cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg 6000
caggaacact gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac 6060
ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg 6120
gataaaatgc ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat 6180
ctcatctgta acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc 6240
atcgggcttc ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc 6300
ccatttatac ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga 6360
cgtttcccgt tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag 6420
ttttattgtt catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga 6480
cacaacgtgg ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat 6540
gagcggatac atatttgaat gtatttagaa aaataaacaa ataggggttc cgcgcacatt 6600
tccccgaaaa gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa 6660
aaataggcgt atcacgaggc cctttcgtc 6689

<210> 124
<211> 6785
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 124
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720

catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gcccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cgatcggccc 2820
actgcaacat cagccgcacc gcctggaaca agaccctgca ggaggtgggc aagaagctgg 2880
ccgagcactt ccccaacaag gccatcaagt tcgccaagca cagcggcggc gacctggaga 2940
tcaccaccca cagcttcaac tgccgcggcg agttcttcta ctgcaacacc agcagcctgt 3000
tcaacagcac ctacaccccc aacagcaccg agaacatcac cggcaccgag aacagcatca 3060
tcaccatccc ctgccgcatc aagcagatca tcaacatgtg gcagggcgtg ggccgcgcca 3120
tgtacgcccc ccccatcgag ggcatcctga cctgccgcag caacatcacc ggcctgctgc 3180
tgacccgcga cggcggcacc ggcatgcacg acaccgagat cttccgcccc gagggcggcg 3240
acatgcgcga caactggcgc agcgagctgt acaagtacaa ggtggtggag atcaagcccc 3300
tgggcatcgc ccccaccaag gccaagctta ccgtgcaggt gcgccagctg ctgagcggca 3360
tcgtgcagca gcagagcaac ctgctgcgcg ccatcgaggc ccagcagcac atgctgcagc 3420
tgaccgtgtg gggcatcaag cagctgcaga cccgcgtgct ggccatcgag cgctacctgc 3480
gcgaccagca gctcgaggac atctggaaca acatgacctg gatgcagtgg gaccgcgaga 3540
tcagcaacta caccaacacc atctaccgcc tgctggagga cagccagaac cagcaggaga 3600
agaacgagca ggacctgctg gccctggaca agtggcagaa cctgtggacc tggttcggca 3660
tcaccaactg gctgtggtac atcaagatct tcatcaagat cgtgggcggc ctgatcggcc 3720
tgcgcatcat cttcgccgtg ctgagcatct gaacacgtgg gatccagatc tgctgtgcct 3780
tctagttgcc agccatctgt tgtttgcccc tcccccgtgc cttccttgac cctggaaggt 3840
gccactccca ctgtcctttc ctaataaaat gaggaaattg catcgcattg tctgagtagg 3900
tgtcattcta ttctgggggg tggggtgggg caggacagca agggggagga ttgggaagac 3960
aatagcaggc atgctgggga tgcggtgggc tctatgggta cccaggtgct gaagaattga 4020

cccggttcct cctgggccag aaagaagcag gcacatcccc ttctctgtga cacaccctgt 4080
ccacgccccc ggttcttagt tccagcccca ctcataggac actcatagct caggagggct 4140
ccgccttcaa tcccacccgc taaagtactt ggagcggtct ctccctccct catcagccca 4200
ccaaaccaaa cctagcctcc aagagtggga agaaattaaa gcaagatagg ctattaagtg 4260
cagagggaga gaaaatgcct ccaacatgtg aggaagtaat gagagaaatc atagaatttt 4320
aaggccatga tttaaggcca tcatggcctt aatcttccgc ttcctcgctc actgactcgc 4380
tgcgctcggt cgttcggctg cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt 4440
tatccacaga atcaggggat aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg 4500
ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca taggctccgc cccctgacg 4560
agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa cccgacagga ctataaagat 4620
accaggcgtt tccccctgga agctccctcg tgcgctctcc tgttccgacc ctgccgctta 4680
ccggatacct gtccgccttt ctcccttcgg gaagcgtggc gctttctcat agctcacgct 4740
gtaggtatct cagttcggtg taggtcgttc gctccaagct gggctgtgtg cacgaacccc 4800
ccgttcagcc cgaccgctgc gccttatccg gtaactatcg tcttgagtcc aacccggtaa 4860
gacacgactt atcgccactg gcagcagcca ctggtaacag gattagcaga gcgaggtatg 4920
taggcggtgc tacagagttc ttgaagtggt ggcctaacta cggctacact agaagaacag 4980
tatttggtat ctgcgctctg ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt 5040
gatccggcaa acaaaccacc gctggtagcg gtggtttttt tgtttgcaag cagcagatta 5100
cgcgcagaaa aaaaggatct caagaagatc ctttgatctt ttctacgggg tctgacgctc 5160
agtggaacga aaactcacgt taagggattt tggtcatgag attatcaaaa aggatcttca 5220
cctagatcct tttaaattaa aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa 5280
cttggtctga cagttaccaa tgcttaatca gtgaggcacc tatctcagcg atctgtctat 5340
ttcgttcatc catagttgcc tgactcgggg gggggggcg ctgaggtctg cctcgtgaag 5400
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 5460
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 5520
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 5580
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 5640
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 5700
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 5760
agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 5820
gactcgtcca acatcaatac aacctattaa tttccccctcg tcaaaaataa ggttatcaag 5880
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 5940
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 6000
caaaccgtta ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa 6060
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 6120
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tccccggggat 6180
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 6240
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 6300
gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 6360
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 6420
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 6480
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 6540
tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt ccccccccccc 6600
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 6660
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 6720
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 6780
tcgtc 6785

<210> 125
<211> 6716
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 125
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220
tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gcccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cgatcggccc 2820
actgcaacat cagccgcacc gcctggaaca agaccctgca ggaggtgggc aagaagctgg 2880
ccgagcactt ccccaacaag gccatcaagt tcgccaagca cagcggcggc gacctggaga 2940
tcaccaccca cagcttcaac tgccgcggcg agttcttcta ctgcaacacc cgatcgatcc 3000
cctgccgcat caagcagatc atcaacatgt ggcagggcgt gggccgcgcc atgtacgccc 3060

ccccccatcga gggcatcctg acctgccgca gcaacatcac cggcctgctg ctgacccgcg 3120
acggcggcac cggcatgcac gacaccgaga tcttccgccc cgagggcggc gacatgcgcg 3180
acaactggcg cagcgagctg tacaagtaca aggtggtgga gatcaagccc ctgggcatcg 3240
cccccaccaa ggccaagctt accgtgcagg tgcgccagct gctgagcggc atcgtgcagc 3300
agcagagcaa cctgctgcgc gccatcgagg cccagcagca catgctgcag ctgaccgtgt 3360
ggggcatcaa gcagctgcag acccgcgtgc tggccatcga gcgctacctg cgcgaccagc 3420
agctcgagga catctggaac aacatgacct ggatgcagtg ggaccgcgag atcagcaact 3480
acaccaacac catctaccgc ctgctggagg acagccagaa ccagcaggag aagaacgagc 3540
aggacctgct ggccctggac aagtggcaga acctgtggac ctggttcggc atcaccaact 3600
ggctgtggta catcaagatc ttcatcaaga tcgtgggcgg cctgatcggc ctgcgcatca 3660
tcttcgccgt gctgagcatc tgaacacgtg ggatccagat ctgctgtgcc ttctagttgc 3720
cagccatctg ttgtttgccc ctccccctgg ccttccttga ccctggaagg tgccactccc 3780
actgtccttt cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct 3840
attctggggg gtggggtggg gcaggacagc aaggggagg attgggaaga caatagcagg 3900
catgctgggg atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc 3960
tcctgggcca gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc 4020
tggttcttag ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca 4080
atcccacccg ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa 4140
acctagcctc caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag 4200
agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg 4260
atttaaggcc atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg 4320
tcgttcggct gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag 4380
aatcagggga taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc 4440
gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca 4500
aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt 4560
ttcccccctgg aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc 4620
tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc 4680
tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc 4740
ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact 4800
tatcgccact ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg 4860
ctacagagtt cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta 4920
tctgcgctct gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca 4980
aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa 5040
aaaaaggatc tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg 5100
aaaactcacg ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc 5160
ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg 5220
acagttacca atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat 5280
ccatagttgc ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg 5340
ctgactcata ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt 5400
tgatgagagc tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg 5460
aacggtctgc gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat 5520
ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca 5580
attaaccaat tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat 5640
atcaggatta tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc 5700
accgaggcag ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc 5760
aacatcaata caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc 5820
accatgagtg acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac 5880
ttgttcaaca ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt 5940
attcattcgt gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt 6000
acaaacagga atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc 6060
acctgaatca ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt 6120
gagtaaccat gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa 6180
ttccgtcagc cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt 6240
gccatgtttc agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc 6300
acctgattgc ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt 6360

ggaatttaat cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct 6420
tgtattactg tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg 6480
tgcaatgtaa catcagagat tttgagacac aacgtggctt tccccccccc cccattattg 6540
aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa 6600
taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac 6660
cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6716

<210> 126
<211> 6797
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 126
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgcgt ggagggcatc cagcgcaact ggaagcagtg gtggatctgg ggcatcctgg 1980
gcttctggat ggtgatgatc tacaacgtgc gcggcaacct gtgggtgacc gtgtactacg 2040
gcgtgcccgt gtggaaggag gccaagacca ccctgttctg cgccagcgac gccaaggcct 2100
acgacgccga ggtgcacaac gtgtgggcca cccacgcctg cgtgcccacc gaccccaacc 2160
cccaggagat ggtgctggag aacgtgaccg agaacttcaa catgtgggag aacgacatgg 2220

tggagcagat gcaccaggac atcatcagcc tgtgggacca gagcctgaag ccctgcgtga 2280
agctgacccc cctgtgcgtg accctgcact gcagcaaccg caccatcgac tacaacaacc 2340
gcaccgacaa catgggcggc gagatcaaga actgcagctt caacatgacc accgaggtgc 2400
gcgacaagcg cgagaaggtg cacgccctgt tctaccgcct ggacatcgtg cccctgaaga 2460
acgagagcag caacaccagc ggcgactacc gcctgatcaa ctgcaacacc agcgccatca 2520
cccaggcctg ccccaaggtg agcttcgacc ccatccccat ccactactgc gcccccgccg 2580
gctacgccat cctgaagtgc aacaacaaga ccttcaacgg caccggcccc tgcaacaacg 2640
tgagcaccat ccagtgcacc cacggcacca agcccgtggt gagcacccag ctgctgctga 2700
acggcagcct ggccgaggag gagatcatca tccgcagcaa gaacctgacc gacaacgtga 2760
agaccatcat cgtgcacctg aacgagagcg tggagatcaa ctgcacccgc cccaacaaca 2820
acacccgcaa gagcatccgc atcggccccg gccaggcctt ctacgccacc ggcgagatca 2880
tcggcgacat ccgccaggcc cactgcaaca tcagccgcac cgcctggaac aagaccctgc 2940
aggaggtggg caagaagctg gccgagcact tccccaacaa ggccatcaag ttcgccaagc 3000
acagcggcgg cgacctggag atcaccaccc acagcttcaa ctgccgcggc gagttcttct 3060
actgcaacac ccgatcgatc ccctgccgca tcaagcagat catcaacatg tggcagggcg 3120
tgggccgcgc catgtacgcc ccccccatcg agggcatcct gacctgccgc agcaacatca 3180
ccggcctgct gctgacccgc gacggcggca ccggcatgca cgacaccgag atcttccgcc 3240
ccgagggcgg cgacatgcgc gacaactggc gcagcgagct gtacaagtac aaggtggtgg 3300
agatcaagcc cctgggcatc gcccccacca aggccaagct taccgtgcag gtgcgccagc 3360
tgctgagcgg catcgtgcag cagcagagca acctgctgcg cgccatcgag gcccagcagc 3420
acatgctgca gctgaccgtg tggggcatca agcagctgca gacccgcgtg ctggccatcg 3480
agcgctacct gcgcgaccag cagctcgagg acatctggaa caacatgacc tggatgcagt 3540
gggaccgcga gatcagcaac tacaccaaca ccatctaccg cctgctggag gacagccaga 3600
accagcagga gaagaacgag caggacctgc tggccctgga caagtggcag aacctgtgga 3660
cctggttcgg catcaccaac tggctgtggt acatcaagat cttcatcaag atcgtgggcg 3720
gcctgatcgg cctgcgcatc atcttcgccg tgctgagcat ctgaacacgt gggatccaga 3780
tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctccccccgt gccttccttg 3840
accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat 3900
tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caaggggggag 3960
gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg 4020
ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt 4080
gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag 4140
ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc 4200
ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata 4260
ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa 4320
tcatagaatt ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc 4380
tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg 4440
cggtaatacg gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag 4500
gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc 4560
gccccccctga cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag 4620
gactataaag ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga 4680
ccctgccgct taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc 4740
atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg 4800
tgcacgaacc ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt 4860
ccaacccggt aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca 4920
gagcgaggta tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca 4980
ctagaagaac agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag 5040
ttggtagctc ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca 5100
agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg 5160
ggtctgacgc tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa 5220
aaaggatctt cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta 5280
tatatgagta aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag 5340
cgatctgtct atttcgttca tccatagttg cctgactcgg ggggggggg cgctgaggtc 5400
tgcctcgtga agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc 5460
agaaagtgag ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt 5520

tgaacttttg ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct 5580
tcaactcagc aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat 5640
gctctgccag tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa 5700
atgaaactgc aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt 5760
ctgtaatgaa ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg 5820
gtctgcgatt ccgactcgtc caacatcaat acaacctatt aatttccccc cgtcaaaaat 5880
aaggttatca agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag 5940
cttatgcatt tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc 6000
actcgcatca accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg 6060
atcgctgtta aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc 6120
cagcgcatca acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt 6180
tttcccgggg atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt 6240
gatggtcgga agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac 6300
atcattggca acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc 6360
atacaatcga tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc 6420
atataaatca gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg 6480
aatatggctc ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca 6540
tgatgatata tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct 6600
ttcccccccc ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat 6660
atttgaatgt atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt 6720
gccacctgac gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat 6780
cacgaggccc tttcgtc 6797

<210> 127
<211> 6718
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 127
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgccccа ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260

tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tccgaacaac aacacccgta aatccatgcg tatcggtccg ggtcagacct 2820
tctacgctac cggtgacatc atcggtgaca tccgtcaggc ttactgcaac atctccggtt 2880
ccaaatggaa cgaaaccctg aaacgtgtta aagaaaaact gcaggaaaac tacaacaaca 2940
acaaaaccat caaattcgct ccgtcctccg gtggtgacct ggaaatcacc acccactcct 3000
tcaactgccg tggtgaattc ttctactgca acaccacccg tctgttcaac aacaacgcta 3060
ccgaagacga aaccatcacc ctgccgtgcc gtatcaaaca gatcatcaac atgtggcagg 3120
gtgttggtcg tgctatgtac gctccgccga tcgctggtaa catcacctgc aaatccaaca 3180
tcaccggtct gctgctggtt cgtgacggtg gtgaagacaa caaaaccgaa gaaatcttcc 3240
gtccgggtgg tggtaacatg aaagacaact ggcgttccga actgtacaaa tacaaagtta 3300
tcgaactgaa accgctgggt atcgctccga ccggtgctaa gcttaccgtt caggctcgtc 3360
agctgctgtc ctccatcgtt cagcagcagt ccaacctgct gcgtgctatc gaagctcagc 3420
agcacatgct gcagctgacc gtttggggta tcaaacagct gcagacccgt gttctggcta 3480
tcgaacgtta cctgaaagac cagcagctcg agatctggaa caacatgacc tggatggaat 3540
gggaccgtga aatctccaac tacaccgaca ccatctaccg tctgctggaa gactcccaga 3600
cccagcagga aaaaaacgaa aaagacctgc tggctctgga ctcctggaaa aacctgtggt 3660
cctggttcga catctccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 3720
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3780
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3840
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3900
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3960
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 4020
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 4080
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4140
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4200
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4260
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4320
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4380
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4440
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca 4500
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4560

gtttcccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4620
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4680
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac ccccgttca 4740
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4800
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4860
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4920
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4980
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5040
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5100
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5160
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5220
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5280
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5340
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5400
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5460
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5520
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5580
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5640
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5700
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5760
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5820
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5880
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5940
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6000
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6060
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 6120
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6180
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6240
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6300
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6360
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6420
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6480
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttcccccccc cccccattat 6540
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6600
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6660
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6718

<210> 128
<211> 6586
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 128
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420

cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2640
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2700
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2760
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2820
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2880
gtgaattctt ctactgcaac accacccgtc tgttcaacaa caacgctacc gaagacgaaa 2940
ccatcaccct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 3000
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 3060
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3120
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3180
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3240
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3300
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3360
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3420
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3480
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3540
tctccaactg gctgtggtga ggatccagat ctgctgtgcc ttctagttgc cagccatctg 3600
ttgtttgccc ctcccccgtg ccttccttga ccctggaagg tgccactccc actgtccttt 3660
cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct attctggggg 3720

gtggggtggg gcaggacagc aaggggggagg attgggaaga caatagcagg catgctgggg 3780
atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc tcctgggcca 3840
gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc tggttcttag 3900
ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca atcccacccg 3960
ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa acctagcctc 4020
caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag agaaaatgcc 4080
tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg atttaaggcc 4140
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4200
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4260
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4320
cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca aaaatcgacg 4380
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 4440
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 4500
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 4560
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 4620
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 4680
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 4740
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 4800
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 4860
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 4920
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 4980
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5040
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5100
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5160
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5220
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5280
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5340
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 5400
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 5460
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 5520
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 5580
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 5640
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 5700
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 5760
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 5820
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 5880
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 5940
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6000
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6060
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6120
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6180
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6240
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6300
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6360
catcagagat tttgagacac aacgtggctt tcccccccccc cccattattg aagcatttat 6420
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 6480
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 6540
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6586

<210> 129
<211> 6505
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 129
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2640
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2700
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2760
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2820
ccacccgtct gttcaacaac aacgctaccg aagacgaaac catcaccctg ccgtgccgta 2880
tcaaacagat catcaacatg tggcagggtg ttggtcgtgc tatgtacgct ccgccgatcg 2940
ctggtaacat cacctgcaaa tccaacatca ccggtctgct gctggttcgt gacggtggtg 3000

aagacaacaa aaccgaagaa atcttccgtc cgggtggtgg taacatgaaa gacaactggc 3060
gttccgaact gtacaaatac aaagttatcg aactgaaacc gctgggtatc gctccgaccg 3120
gtgctaagct taccgttcag gctcgtcagc tgctgtcctc catcgttcag cagcagtcca 3180
acctgctgcg tgctatcgaa gctcagcagc acatgctgca gctgaccgtt tggggtatca 3240
aacagctgca gacccgtgtt ctggctatcg aacgttacct gaaagaccag cagctcgaga 3300
tctggaacaa catgacctgg atggaatggg accgtgaaat ctccaactac accgacacca 3360
tctaccgtct gctggaagac tcccagaccc agcaggaaaa aaacgaaaaa gacctgctgg 3420
ctctggactc ctggaaaaac ctgtggtcct ggttcgacat ctccaactgg ctgtggtgag 3480
gatccagatc tgctgtgcct tctagttgcc agccatctgt tgtttgcccc tcccccgtgc 3540
cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat gaggaaattg 3600
catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg caggacagca 3660
agggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc tctatgggta 3720
cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag gcacatcccc 3780
ttctctgtga cacaccctgt ccacgcccct ggttcttagt tccagcccca ctcataggac 3840
actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt ggagcggtct 3900
ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga agaaattaaa 3960
gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg aggaagtaat 4020
gagagaaatc atagaatttt aaggccatga tttaaggcca tcatggcctt aatcttccgc 4080
ttcctcgctc actgactcgc tgcgctcggt cgttcggctg cggcgagcgg tatcagctca 4140
ctcaaaggcg gtaatacggt tatccacaga atcaggggat aacgcaggaa agaacatgtg 4200
agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca 4260
taggctccgc cccctgacg agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa 4320
cccgacagga ctataaagat accaggcgtt tccccctgga agctccctcg tgcgctctcc 4380
tgttccgacc ctgccgctta ccggatacct gtccgccttt ctcccttcgg gaagcgtggc 4440
gctttctcat agctcacgct gtaggtatct cagttcggtg taggtcgttc gctccaagct 4500
gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc gccttatccg gtaactatcg 4560
tcttgagtcc aacccggtaa gacacgactt atcgccactg gcagcagcca ctggtaacag 4620
gattagcaga gcgaggtatg taggcggtgc tacagagttc ttgaagtggt ggcctaacta 4680
cggctacact agaagaacag tatttggtat ctgcgctctg ctgaagccag ttaccttcgg 4740
aaaaagagtt ggtagctctt gatccggcaa acaaaccacc gctggtagcg gtggtttttt 4800
tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct caagaagatc ctttgatctt 4860
ttctacgggg tctgacgctc agtggaacga aaactcacgt taagggattt tggtcatgag 4920
attatcaaaa aggatcttca cctagatcct tttaaattaa aaatgaagtt ttaaatcaat 4980
ctaaagtata tatgagtaaa cttggtctga cagttaccaa tgcttaatca gtgaggcacc 5040
tatctcagcg atctgtctat ttcgttcatc catagttgcc tgactcgggg gggggggcg 5100
ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac caggcctgaa tcgccccatc 5160
atccagccag aaagtgaggg agccacggtt gatgagagct ttgttgtagg tggaccagtt 5220
ggtgattttg aacttttgct ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat 5280
ctgatccttc aactcagcaa aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc 5340
agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg 5400
agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata tttttgaaaa 5460
agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat ggcaagatcc 5520
tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa tttcccctcg 5580
tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc cggtgagaat 5640
ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt acgctcgtca 5700
tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg agcgagacga 5760
aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg 5820
aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc taatacctgg 5880
aatgctgttt tcccggggat cgcagtggtg agtaaccatg catcatcagg agtacggata 5940
aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct gaccatctca 6000
tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc tggcgcatcg 6060
ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc gcgagcccat 6120
ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga gcaagacgtt 6180
tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc agacagtttt 6240
attgttcatg atgatatatt tttatcttgt gcaatgtaac atcagagatt ttgagacaca 6300

acgtggcttt ccccccccc ccattattga agcatttatc agggttattg tctcatgagc 6360
ggatacatat ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg cacatttccc 6420
cgaaaagtgc cacctgacgt ctaagaaacc attattatca tgacattaac ctataaaaat 6480
aggcgtatca cgaggccctt tcgtc 6505

<210> 130
<211> 6466
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 130
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340

ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2640
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2700
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2760
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2820
ccgctagcct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 2880
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 2940
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3000
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3060
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3120
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3180
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3240
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3300
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3360
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3420
tctccaactg gctgtggtga ggatccagat ctgctgtgcc ttctagttgc cagccatctg 3480
ttgtttgccc ctcccccgtg ccttccttga ccctggaagg tgccactccc actgtccttt 3540
cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct attctggggg 3600
gtggggtggg gcaggacagc aaggggagg attgggaaga caatagcagg catgctgggg 3660
atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc tcctgggcca 3720
gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc tggttcttag 3780
ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca atcccacccg 3840
ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa acctagcctc 3900
caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag agaaaatgcc 3960
tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg atttaaggcc 4020
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4080
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4140
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4200
cgcgttgctg gcgtttttcc ataggctccg cccccctgac gagcatcaca aaaatcgacg 4260
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 4320
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 4380
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 4440
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 4500
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 4560
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 4620
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 4680
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 4740
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 4800
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 4860
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 4920
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 4980
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5040
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5100
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5160
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5220
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 5280
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 5340
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 5400
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 5460
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 5520
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 5580
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 5640

ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 5700
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 5760
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 5820
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 5880
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 5940
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6000
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6060
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6120
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6180
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6240
catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 6300
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 6360
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 6420
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6466

<210> 131
<211> 6547
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 131
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt ccccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2640
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2700
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2760
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2820
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2880
gtgaattctt ctactgcaac accgctagcc tgccgtgccg tatcaaacag atcatcaaca 2940
tgtggcaggg tgttggtcgt gctatgtacg ctccgccgat cgctggtaac atcacctgca 3000
aatccaacat caccggtctg ctgctggttc gtgacggtgg tgaagacaac aaaaccgaag 3060
aaatcttccg tccgggtggt ggtaacatga aagacaactg gcgttccgaa ctgtacaaat 3120
acaaagttat cgaactgaaa ccgctgggta tcgctccgac cggtgctaag cttaccgttc 3180
aggctcgtca gctgctgtcc tccatcgttc agcagcagtc caacctgctg cgtgctatcg 3240
aagctcagca gcacatgctg cagctgaccg tttggggtat caaacagctg cagacccgtg 3300
ttctggctat cgaacgttac ctgaaagacc agcagctcga gatctggaac aacatgacct 3360
ggatggaatg ggaccgtgaa atctccaact acaccgacac catctaccgt ctgctggaag 3420
actcccagac ccagcaggaa aaaaacgaaa aagacctgct ggctctggac tcctggaaaa 3480
acctgtggtc ctggttcgac atctccaact ggctgtggtg aggatccaga tctgctgtgc 3540
cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg accctggaag 3600
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat tgtctgagta 3660
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag gattgggaag 3720
acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg ctgaagaatt 3780
gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt gacacaccct 3840
gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag ctcaggaggg 3900
ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc ctcatcagcc 3960
caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata ggctattaag 4020
tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa tcatagaatt 4080
ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4140
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4200
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4260
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 4320
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4380
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4440
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4500
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4560
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4620
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4680
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4740
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 4800
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 4860
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 4920
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 4980
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5040

aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5100
atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc tgcctcgtga 5160
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5220
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5280
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5340
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5400
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5460
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5520
ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5580
ccgactcgtc caacatcaat acaacctatt aatttccccc cgtcaaaaat aaggttatca 5640
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5700
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 5760
accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 5820
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 5880
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttccgcggg 5940
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6000
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6060
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6120
tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6180
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6240
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6300
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6360
ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6420
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6480
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6540
tttcgtc 6547

<210> 132
<211> 6637
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 132
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020

tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tgctagcgct tactgcaaca tctccggttc caaatggaac gaaaccctga 2820
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 2880
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 2940
tctactgcaa caccacccgt ctgttcaaca acaacgctac cgaagacgaa accatcaccc 3000
tgccgtgccg tatcaaacag atcatcaaca tgtggcaggg tgttggtcgt gctatgtacg 3060
ctccgccgat cgctggtaac atcacctgca aatccaacat caccggtctg ctgctggttc 3120
gtgacggtgg tgaagacaac aaaaccgaag aaatcttccg tccgggtggt ggtaacatga 3180
aagacaactg gcgttccgaa ctgtacaaat acaaagttat cgaactgaaa ccgctgggta 3240
tcgctccgac cggtgctaag cttaccgttc aggctcgtca gctgctgtcc tccatcgttc 3300
agcagcagtc caacctgctg cgtgctatcg aagctcagca gcacatgctg cagctgaccg 3360
tttggggtat caaacagctg cagacccgtg ttctggctat cgaacgttac ctgaaagacc 3420
agcagctcga gatctggaac aacatgacct ggatggaatg ggaccgtgaa atctccaact 3480
acaccgacac catctaccgt ctgctggaag actcccagac ccagcaggaa aaaaacgaaa 3540
aagacctgct ggctctggac tcctggaaaa acctgtggtc ctggttcgac atctccaact 3600
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3660
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3720
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3780
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3840
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3900
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 3960
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 4020
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4080
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4140
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4200
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4260
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4320

aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4380
ggcgtttttc cataggctcc gcccccctga cgagcatcac aaaaatcgac gctcaagtca 4440
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4500
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4560
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4620
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4680
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4740
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4800
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4860
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4920
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4980
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 5040
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5100
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5160
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5220
ggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5280
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5340
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5400
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5460
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5520
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5580
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5640
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5700
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5760
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5820
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5880
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5940
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 6000
tctaatacct ggaatgctgt tttccgggg atcgcagtgg tgagtaacca tgcatcatca 6060
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6120
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6180
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6240
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6300
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6360
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6420
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6480
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6540
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6600
acctataaaa ataggcgtat cacgaggccc tttcgtc 6637

<210> 133
<211> 6598
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 133
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240

ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tgctagcgct tactgcaaca tctccggttc caaatggaac gaaaccctga 2820
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 2880
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 2940
tctactgcaa caccgctagc ctgccgtgcc gtatcaaaca gatcatcaac atgtggcagg 3000
gtgttggtcg tgctatgtac gctccgccga tcgctggtaa catcacctgc aaatccaaca 3060
tcaccggtct gctgctggtt cgtgacggtg gtgaagacaa caaaaccgaa gaaatcttcc 3120
gtccgggtgg tggtaacatg aaagacaact ggcgttccga actgtacaaa tacaaagtta 3180
tcgaactgaa accgctgggt atcgctccga ccggtgctaa gcttaccgtt caggctcgtc 3240
agctgctgtc ctccatcgtt cagcagcagt ccaacctgct gcgtgctatc gaagctcagc 3300
agcacatgct gcagctgacc gtttggggta tcaaacagct gcagacccgt gttctggcta 3360
tcgaacgtta cctgaaagac cagcagctcg agatctggaa caacatgacc tggatggaat 3420
gggaccgtga aatctccaac tacaccgaca ccatctaccg tctgctggaa gactcccaga 3480
cccagcagga aaaaaacgaa aaagacctgc tggctctgga ctcctggaaa aacctgtggt 3540

cctggttcga catctccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 3600
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3660
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3720
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3780
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3840
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3900
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 3960
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4020
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4080
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4140
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4200
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4260
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4320
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgcccccctg acgagcatca 4380
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4440
gtttcccccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4500
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4560
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4620
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4680
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4740
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4800
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4860
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4920
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 4980
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5040
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5100
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5160
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5220
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5280
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5340
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5400
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5460
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5520
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5580
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5640
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5700
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5760
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5820
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5880
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 5940
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccccgg gatcgcagtg 6000
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6060
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6120
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6180
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6240
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6300
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6360
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6420
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6480
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6540
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6598

<210> 134

<211> 6679
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 134
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tccgaacaac aacacccgta aatccatgcg tatcggtccg ggtcagacct 2820

tctacgctac cggtgacatc atcggtgaca tccgtcaggc ttactgcaac atctccggtt 2880
ccaaatggaa cgaaaccctg aaacgtgtta aagaaaaact gcaggaaaac tacaacaaca 2940
acaaaaccat caaattcgct ccgtcctccg gtggtgacct ggaaatcacc acccactcct 3000
tcaactgccg tggtgaattc ttctactgca acaccgctag cctgccgtgc cgtatcaaac 3060
agatcatcaa catgtggcag ggtgttggtc gtgctatgta cgctccgccg atcgctggta 3120
acatcacctg caaatccaac atcaccggtc tgctgctggt tcgtgacggt ggtgaagaca 3180
acaaaaccga agaaatcttc cgtccgggtg gtggtaacat gaaagacaac tggcgttccg 3240
aactgtacaa atacaaagtt atcgaactga aaccgctggg tatcgctccg accggtgcta 3300
agcttaccgt tcaggctcgt cagctgctgt cctccatcgt tcagcagcag tccaacctgc 3360
tgcgtgctat cgaagctcag cagcacatgc tgcagctgac cgtttggggt atcaaacagc 3420
tgcagacccg tgttctggct atcgaacgtt acctgaaaga ccagcagctc gagatctgga 3480
acaacatgac ctggatggaa tgggaccgtg aaatctccaa ctacaccgac accatctacc 3540
gtctgctgga agactcccag acccagcagg aaaaaaacga aaaagacctg ctggctctgg 3600
actcctggaa aaacctgtgg tcctggttcg acatctccaa ctggctgtgg tgaggatcca 3660
gatctgctgt gccttctagt tgccagccat ctgttgtttg ccccteeccc gtgccttcct 3720
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3780
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 3840
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 3900
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 3960
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 4020
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 4080
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 4140
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4200
aatcatagaa ttttaaggcc atgatttaag gccatcatgg ccttaatctt ccgcttcctc 4260
gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa 4320
ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa 4380
aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct 4440
ccgccccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac 4500
aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc 4560
gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc 4620
tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg 4680
tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga 4740
gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta acaggattag 4800
cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta 4860
cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag 4920
agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg 4980
caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac 5040
ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc 5100
aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag 5160
tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc 5220
agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag ggcgctgagg 5280
tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag 5340
ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat 5400
tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc 5460
cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta 5520
atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc 5580
aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt 5640
ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat 5700
cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa 5760
ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa 5820
agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa 5880
tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg 5940
cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact 6000
gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct 6060
gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc 6120

ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta 6180
acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc 6240
ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac 6300
ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt 6360
tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt 6420
catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg 6480
ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac 6540
atatttgaat gtatttagaa aaataaacaa ataggggttc cgcgcacatt tccccgaaaa 6600
gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt 6660
atcacgaggc cctttcgtc 6679

<210> 135
<211> 6646
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 135
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980

gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2700
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2760
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2820
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2880
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2940
gtgaattctt ctactgcaac accacccgtc tgttcaacaa caacgctacc gaagacgaaa 3000
ccatcaccct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 3060
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 3120
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3180
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3240
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3300
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3360
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3420
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3480
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3540
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3600
tctccaactg gctgtggtga ggatccagat ctgctgtgcc ttctagttgc cagccatctg 3660
ttgtttgccc ctcccccgtg ccttccttga ccctggaagg tgccactccc actgtccttt 3720
cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct attctggggg 3780
gtggggtggg gcaggacagc aagggggagg attgggaaga caatagcagg catgctgggg 3840
atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc tcctgggcca 3900
gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc tggttcttag 3960
ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca atcccacccg 4020
ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa acctagcctc 4080
caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag agaaaatgcc 4140
tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg atttaaggcc 4200
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4260
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4320
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4380
cgcgttgctg gcgtttttcc ataggctccg cccccctgac gagcatcaca aaaatcgacg 4440
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 4500
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 4560
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 4620
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 4680
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 4740
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 4800
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 4860
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 4920
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 4980
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 5040
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 5100
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5160
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5220
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5280

ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5340
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5400
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 5460
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 5520
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 5580
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 5640
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 5700
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 5760
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 5820
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 5880
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 5940
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 6000
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 6060
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6120
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6180
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6240
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6300
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6360
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6420
catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 6480
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 6540
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 6600
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6646

<210> 136
<211> 6565
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 136
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200

tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2700
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2760
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2820
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2880
ccacccgtct gttcaacaac aacgctaccg aagacgaaac catcaccctg ccgtgccgta 2940
tcaaacagat catcaacatg tggcagggtg ttggtcgtgc tatgtacgct ccgccgatcg 3000
ctggtaacat cacctgcaaa tccaacatca ccggtctgct gctggttcgt gacggtggtg 3060
aagacaacaa aaccgaagaa atcttccgtc cgggtggtgg taacatgaaa gacaactggc 3120
gttccgaact gtacaaatac aaagttatcg aactgaaacc gctgggtatc gctccgaccg 3180
gtgctaagct taccgttcag gctcgtcagc tgctgtcctc catcgttcag cagcagtcca 3240
acctgctgcg tgctatcgaa gctcagcagc acatgctgca gctgaccgtt tggggtatca 3300
aacagctgca gacccgtgtt ctggctatcg aacgttacct gaaagaccag cagctcgaga 3360
tctggaacaa catgacctgg atggaatggg accgtgaaat ctccaactac accgacacca 3420
tctaccgtct gctggaagac tcccagaccc agcaggaaaa aaacgaaaaa gacctgctgg 3480
ctctggactc ctggaaaaac ctgtggtcct ggttcgacat ctccaactgg ctgtggtgag 3540
gatccagatc tgctgtgcct tctagttgcc agccatctgt tgtttgcccc tcccccgtgc 3600
cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat gaggaaattg 3660
catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg caggacagca 3720
agggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc tctatgggta 3780
cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag gcacatcccc 3840
ttctctgtga cacaccctgt ccacgccccc ggttcttagt tccagcccca ctcataggac 3900
actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt ggagcggtct 3960
ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga agaaattaaa 4020
gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg aggaagtaat 4080
gagagaaatc atagaatttt aaggccatga tttaaggcca tcatggcctt aatcttccgc 4140
ttcctcgctc actgactcgc tgcgctcggt cgttcggctg cggcgagcgg tatcagctca 4200
ctcaaaggcg gtaatacggt tatccacaga atcaggggat aacgcaggaa agaacatgtg 4260
agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc gcgttgctgg cgtttttcca 4320
taggctccgc ccccctgacg agcatcacaa aaatcgacgc tcaagtcaga ggtggcgaaa 4380
cccgacagga ctataaagat accaggcgtt tccccctgga agctccctcg tgcgctctcc 4440
tgttccgacc ctgccgctta ccggatacct gtccgccttt ctcccttcgg gaagcgtggc 4500

gctttctcat agctcacgct gtaggtatct cagttcggtg taggtcgttc gctccaagct 4560
gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc gccttatccg gtaactatcg 4620
tcttgagtcc aacccggtaa gacacgactt atcgccactg gcagcagcca ctggtaacag 4680
gattagcaga gcgaggtatg taggcggtgc tacagagttc ttgaagtggt ggcctaacta 4740
cggctacact agaagaacag tatttggtat ctgcgctctg ctgaagccag ttaccttcgg 4800
aaaaagagtt ggtagctctt gatccggcaa acaaaccacc gctggtagcg gtggtttttt 4860
tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct caagaagatc ctttgatctt 4920
ttctacgggg tctgacgctc agtggaacga aaactcacgt taagggattt tggtcatgag 4980
attatcaaaa aggatcttca cctagatcct tttaaattaa aaatgaagtt ttaaatcaat 5040
ctaaagtata tatgagtaaa cttggtctga cagttaccaa tgcttaatca gtgaggcacc 5100
tatctcagcg atctgtctat ttcgttcatc catagttgcc tgactcgggg gggggggcg 5160
ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac caggcctgaa tcgccccatc 5220
atccagccag aaagtgaggg agccacggtt gatgagagct ttgttgtagg tggaccagtt 5280
ggtgattttg aacttttgct ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat 5340
ctgatccttc aactcagcaa aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc 5400
agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg 5460
agcatcaaat gaaactgcaa tttattcata tcaggattat caataccata tttttgaaaa 5520
agccgtttct gtaatgaagg agaaaactca ccgaggcagt tccataggat ggcaagatcc 5580
tggtatcggt ctgcgattcc gactcgtcca acatcaatac aacctattaa tttcccctcg 5640
tcaaaaataa ggttatcaag tgagaaatca ccatgagtga cgactgaatc cggtgagaat 5700
ggcaaaagct tatgcatttc tttccagact tgttcaacag gccagccatt acgctcgtca 5760
tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg attgcgcctg agcgagacga 5820
aatacgcgat cgctgttaaa aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg 5880
aacactgcca gcgcatcaac aatattttca cctgaatcag gatattcttc taatacctgg 5940
aatgctgttt tccccggggat cgcagtggtg agtaaccatg catcatcagg agtacggata 6000
aaatgcttga tggtcggaag aggcataaat tccgtcagcc agtttagtct gaccatctca 6060
tctgtaacat cattggcaac gctacctttg ccatgtttca gaaacaactc tggcgcatcg 6120
ggcttcccat acaatcgata gattgtcgca cctgattgcc cgacattatc gcgagcccat 6180
ttatacccat ataaatcagc atccatgttg gaatttaatc gcggcctcga gcaagacgtt 6240
tcccgttgaa tatggctcat aacacccctt gtattactgt ttatgtaagc agacagtttt 6300
attgttcatg atgatatatt tttatcttgt gcaatgtaac atcagagatt ttgagacaca 6360
acgtggcttt ccccccccc ccattattga agcatttatc agggttattg tctcatgagc 6420
ggatacatat ttgaatgtat ttagaaaaat aaacaaatag gggttccgcg cacatttccc 6480
cgaaaagtgc cacctgacgt ctaagaaacc attattatca tgacattaac ctataaaaat 6540
aggcgtatca cgaggccctt tcgtc 6565

<210> 137
<211> 6526
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 137
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480

catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2700
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2760
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2820
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2880
ccgctagcct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 2940
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 3000
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3060
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3120
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3180
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3240
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3300
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3360
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3420
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3480
tctccaactg gctgtggtga ggatccagat ctgctgtgcc ttctagttgc cagccatctg 3540
ttgtttgccc ctcccccgtg ccttccttga ccctggaagg tgccactccc actgtccttt 3600
cctaataaaa tgaggaaatt gcatcgcatt gtctgagtag gtgtcattct attctggggg 3660
gtggggtggg gcaggacagc aagggggagg attgggaaga caatagcagg catgctgggg 3720
atgcggtggg ctctatgggt acccaggtgc tgaagaattg acccggttcc tcctgggcca 3780

gaaagaagca ggcacatccc cttctctgtg acacaccctg tccacgcccc tggttcttag 3840
ttccagcccc actcatagga cactcatagc tcaggagggc tccgccttca atcccacccg 3900
ctaaagtact tggagcggtc tctccctccc tcatcagccc accaaaccaa acctagcctc 3960
caagagtggg aagaaattaa agcaagatag gctattaagt gcagagggag agaaaatgcc 4020
tccaacatgt gaggaagtaa tgagagaaat catagaattt taaggccatg atttaaggcc 4080
atcatggcct taatcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 4140
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 4200
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 4260
cgcgttgctg gcgtttttcc ataggctccg ccccccctgac gagcatcaca aaaatcgacg 4320
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 4380
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 4440
tctcccttcg ggaagcgtgg cgctttctca tagctcacgc tgtaggtatc tcagttcggt 4500
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 4560
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 4620
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 4680
cttgaagtgg tggcctaact acggctacac tagaagaaca gtatttggta tctgcgctct 4740
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 4800
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 4860
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 4920
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 4980
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 5040
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 5100
ctgactcggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 5160
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 5220
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 5280
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 5340
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 5400
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 5460
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 5520
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 5580
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 5640
acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 5700
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 5760
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 5820
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 5880
ggatattctt ctaatacctg gaatgctgtt ttccgcggga tcgcagtggt gagtaaccat 5940
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 6000
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 6060
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 6120
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 6180
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 6240
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 6300
catcagagat tttgagacac aacgtggctt tcccccccccc cccattattg aagcatttat 6360
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 6420
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 6480
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 6526

<210> 138
<211> 6607
<212> DNA
<213> Artificial Sequence

<220>

<223> plasmid pVR1012x/s containing HIV genes

<400> 138

tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2700
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2760
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2820
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2880
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2940
gtgaattctt ctactgcaac accgctagcc tgccgtgccg tatcaaacag atcatcaaca 3000
tgtggcaggg tgttggtcgt gctatgtacg ctccgccgat cgctggtaac atcacctgca 3060
aatccaacat caccggtctg ctgctggttc gtgacggtgg tgaagacaac aaaaccgaag 3120

aaatcttccg tccgggtggt ggtaacatga aagacaactg gcgttccgaa ctgtacaaat 3180
acaaagttat cgaactgaaa ccgctgggta tcgctccgac cggtgctaag cttaccgttc 3240
aggctcgtca gctgctgtcc tccatcgttc agcagcagtc caacctgctg cgtgctatcg 3300
aagctcagca gcacatgctg cagctgaccg tttggggtat caaacagctg cagacccgtg 3360
ttctggctat cgaacgttac ctgaaagacc agcagctcga gatctggaac aacatgacct 3420
ggatggaatg ggaccgtgaa atctccaact acaccgacac catctaccgt ctgctggaag 3480
actcccagac ccagcaggaa aaaaacgaaa aagacctgct ggctctggac tcctggaaaa 3540
acctgtggtc ctggttcgac atctccaact ggctgtggtg aggatccaga tctgctgtgc 3600
cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg accctggaag 3660
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat tgtctgagta 3720
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag gattgggaag 3780
acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg ctgaagaatt 3840
gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt gacacaccct 3900
gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag ctcaggaggg 3960
ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc ctcatcagcc 4020
caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata ggctattaag 4080
tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa tcatagaatt 4140
ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4200
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4260
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4320
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 4380
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4440
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4500
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4560
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4620
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4680
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4740
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4800
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 4860
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 4920
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 4980
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 5040
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5100
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5160
atttcgttca tccatagttg cctgactcgg gggggggggg cgctgaggtc tgcctcgtga 5220
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5280
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5340
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5400
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5460
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5520
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5580
ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5640
ccgactcgtc caacatcaat acaacctatt aatttccgct cgtcaaaaat aaggttatca 5700
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5760
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 5820
accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 5880
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 5940
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttccgcggg 6000
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6060
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6120
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6180
tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6240
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6300
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6360
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6420

ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6480
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6540
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6600
tttcgtc 6607

<210> 139
<211> 6676
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 139
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340

ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaataca tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt gctagcgctt 2820
actgcaacat ctccggttcc aaatggaacg aaaccctgaa acgtgttaaa gaaaaactgc 2880
aggaaaacta caacaacaac aaaaccatca aattcgctcc gtcctccggt ggtgacctgg 2940
aaatcaccac ccactccttc aactgccgtg gtgaattctt ctactgcaac accacccgtc 3000
tgttcaacaa caacgctacc gaagacgaaa ccatcaccct gccgtgccgt atcaaacaga 3060
tcatcaacat gtggcagggt gttggtcgtg ctatgtacgc tccgccgatc gctggtaaca 3120
tcacctgcaa atccaacatc accggtctgc tgctggttcg tgacggtggt gaagacaaca 3180
aaaccgaaga aatcttccgt ccgggtggtg gtaacatgaa agacaactgg cgttccgaac 3240
tgtacaaata caaagttatc gaactgaaac cgctgggtat cgctccgacc ggtgctaagc 3300
ttaccgttca ggctcgtcag ctgctgtcct ccatcgttca gcagcagtcc aacctgctgc 3360
gtgctatcga agctcagcag cacatgctgc agctgaccgt ttggggtatc aaacagctgc 3420
agacccgtgt tctggctatc gaacgttacc tgaaagacca gcagctcgag atctggaaca 3480
acatgacctg gatggaatgg gaccgtgaaa tctccaacta caccgacacc atctaccgtc 3540
tgctggaaga ctcccagacc cagcaggaaa aaaacgaaaa agacctgctg gctctggact 3600
cctggaaaaa cctgtggtcc tggttcgaca tctccaactg gctgtggtga ggatccagat 3660
ctgctgtgcc ttctagttgc cagccatctg ttgtttgccc ctcccccgtg ccttccttga 3720
ccctggaagg tgccactccc actgtccttt cctaataaaa tgaggaaatt gcatcgcatt 3780
gtctgagtag gtgtcattct attctggggg gtggggtggg gcaggacagc aaggggagg 3840
attgggaaga caatagcagg catgctgggg atgcggtggg ctctatgggt acccaggtgc 3900
tgaagaattg acccggttcc tcctgggcca gaaagaagca ggcacatccc cttctctgtg 3960
acacaccctg tccacgcccc tggttcttag ttccagcccc actcatagga cactcatagc 4020
tcaggagggc tccgccttca atcccacccg ctaaagtact tggagcggtc tctccctccc 4080
tcatcagccc accaaaccaa acctagcctc caagagtggg aagaaattaa agcaagatag 4140
gctattaagt gcagagggag agaaaatgcc tccaacatgt gaggaagtaa tgagagaaat 4200
catagaattt taaggccatg atttaaggcc atcatggcct taatcttccg cttcctcgct 4260
cactgactcg ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc actcaaaggc 4320
ggtaatacgg ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg 4380
ccagcaaaag gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg 4440
ccccccctgac gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg 4500
actataaaga taccaggcgt ttcccccctgg aagctccctc gtgcgctctc ctgttccgac 4560
cctgccgctt accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca 4620
tagctcacgc tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt 4680
gcacgaaccc cccgttcagc ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc 4740
caacccggta agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag 4800
agcgaggtat gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac 4860
tagaagaaca gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaaagagt 4920
tggtagctct tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa 4980
gcagcagatt acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg 5040
gtctgacgct cagtggaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa 5100
aaggatcttc acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat 5160
atatgagtaa acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc 5220
gatctgtcta tttcgttcat ccatagttgc ctgactcggg gggggggggc gctgaggtct 5280
gcctcgtgaa gaaggtgttg ctgactcata ccaggcctga atcgccccat catccagcca 5340
gaaagtgagg gagccacggt tgatgagagc tttgttgtag gtggaccagt tggtgatttt 5400
gaacttttgc tttgccacgg aacggtctgc gttgtcggga agatgcgtga tctgatcctt 5460
caactcagca aaagttcgat ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg 5520
ctctgccagt gttacaacca attaaccaat tctgattaga aaaactcatc gagcatcaaa 5580
tgaaactgca atttattcat atcaggatta tcaataccat atttttgaaa aagccgtttc 5640

tgtaatgaag gagaaaactc accgaggcag ttccatagga tggcaagatc ctggtatcgg 5700
tctgcgattc cgactcgtcc aacatcaata caacctatta atttcccctc gtcaaaaata 5760
aggttatcaa gtgagaaatc accatgagtg acgactgaat ccggtgagaa tggcaaaagc 5820
ttatgcattt ctttccagac ttgttcaaca ggccagccat tacgctcgtc atcaaaatca 5880
ctcgcatcaa ccaaaccgtt attcattcgt gattgcgcct gagcgagacg aaatacgcga 5940
tcgctgttaa aaggacaatt acaaacagga atcgaatgca accggcgcag gaacactgcc 6000
agcgcatcaa caatattttc acctgaatca ggatattctt ctaatacctg gaatgctgtt 6060
ttccccgggga tcgcagtggt gagtaaccat gcatcatcag gagtacggat aaaatgcttg 6120
atggtcggaa gaggcataaa ttccgtcagc cagtttagtc tgaccatctc atctgtaaca 6180
tcattggcaa cgctaccttt gccatgtttc agaaacaact ctggcgcatc gggcttccca 6240
tacaatcgat agattgtcgc acctgattgc ccgacattat cgcgagccca tttataccca 6300
tataaatcag catccatgtt ggaatttaat cgcggcctcg agcaagacgt ttcccgttga 6360
atatggctca taacacccct tgtattactg tttatgtaag cagacagttt tattgttcat 6420
gatgatatat ttttatcttg tgcaatgtaa catcagagat tttgagacac aacgtggctt 6480
tccccccccc cccattattg aagcatttat cagggttatt gtctcatgag cggatacata 6540
tttgaatgta tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg 6600
ccacctgacg tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc 6660
acgaggccct ttcgtc 6676

<210> 140
<211> 6637
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 140
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500

agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaatacа tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt gctagcgctt 2820
actgcaacat ctccggttcc aaatggaacg aaaccctgaa acgtgttaaa gaaaaactgc 2880
aggaaaacta caacaacaac aaaaccatca aattcgctcc gtcctccggt ggtgacctgg 2940
aaatcaccac ccactccttc aactgccgtg gtgaattctt ctactgcaac accgctagcc 3000
tgccgtgccg tatcaaacag atcatcaaca tgtggcaggg tgttggtcgt gctatgtacg 3060
ctccgccgat cgctggtaac atcacctgca aatccaacat caccggtctg ctgctggttc 3120
gtgacggtgg tgaagacaac aaaaccgaag aaatcttccg tccgggtggt ggtaacatga 3180
aagacaactg gcgttccgaa ctgtacaaat acaaagttat cgaactgaaa ccgctgggta 3240
tcgctccgac cggtgctaag cttaccgttc aggctcgtca gctgctgtcc tccatcgttc 3300
agcagcagtc caacctgctg cgtgctatcg aagctcagca gcacatgctg cagctgaccg 3360
tttggggtat caaacagctg cagacccgtg ttctggctat cgaacgttac ctgaaagacc 3420
agcagctcga gatctggaac aacatgacct ggatggaatg ggaccgtgaa atctccaact 3480
acaccgacac catctaccgt ctgctggaag actcccagac ccagcaggaa aaaaacgaaa 3540
aagacctgct ggctctggac tcctggaaaa acctgtggtc ctggttcgac atctccaact 3600
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3660
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3720
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3780
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3840
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3900
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 3960
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 4020
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4080
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4140
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4200
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4260
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4320
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4380
ggcgtttttc cataggctcc gccccctga cgagcatcac aaaaatcgac gctcaagtca 4440
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4500
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4560
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4620
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4680
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4740
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4800

gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4860
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4920
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4980
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 5040
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5100
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5160
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5220
gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5280
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5340
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5400
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5460
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5520
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5580
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5640
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5700
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5760
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5820
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5880
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5940
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 6000
tctaatacct ggaatgctgt tttccccggg atcgcagtgg tgagtaacca tgcatcatca 6060
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6120
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6180
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6240
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6300
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6360
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6420
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6480
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6540
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6600
acctataaaa ataggcgtat cacgaggccc tttcgtc 6637

<210> 141
<211> 6718
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 141
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720

catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaataca tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt ccgaacaaca 2820
acacccgtaa atccatgcgt atcggtccgg gtcagacctt ctacgctacc ggtgacatca 2880
tcggtgacat ccgtcaggct tactgcaaca tctccggttc caaatggaac gaaaccctga 2940
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 3000
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 3060
tctactgcaa caccgctagc ctgccgtgcc gtatcaaaca gatcatcaac atgtggcagg 3120
gtgttggtcg tgctatgtac gctccgccga tcgctggtaa catcacctgc aaatccaaca 3180
tcaccggtct gctgctggtt cgtgacggtg gtgaagacaa caaaaccgaa gaaatcttcc 3240
gtccgggtgg tggtaacatg aaagacaact ggcgttccga actgtacaaa tacaaagtta 3300
tcgaactgaa accgctgggt atcgctccga ccggtgctaa gcttaccgtt caggctcgtc 3360
agctgctgtc ctccatcgtt cagcagcagt ccaacctgct gcgtgctatc gaagctcagc 3420
agcacatgct gcagctgacc gtttggggta tcaaacagct gcagacccgt gttctggcta 3480
tcgaacgtta cctgaaagac cagcagctcg agatctggaa caacatgacc tggatggaat 3540
gggaccgtga aatctccaac tacaccgaca ccatctaccg tctgctggaa gactcccaga 3600
cccagcagga aaaaaacgaa aaagacctgc tggctctgga ctcctggaaa aacctgtggt 3660
cctggttcga catctccaac tggctgtggt gaggatccag atctgctgtg ccttctagtt 3720
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3780
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3840
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3900
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3960
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 4020

```
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 4080
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4140
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4200
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4260
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4320
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4380
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4440
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgcccccctg acgagcatca 4500
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4560
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4620
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4680
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4740
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4800
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4860
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4920
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4980
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5040
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5100
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5160
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5220
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5280
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5340
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5400
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5460
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5520
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5580
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5640
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5700
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5760
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5820
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5880
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5940
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6000
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6060
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccgggg gatcgcagtg 6120
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6180
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6240
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6300
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6360
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6420
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6480
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6540
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6600
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6660
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc   6718
```

<210> 142
<211> 6790
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 142
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tccgaacaac aacacccgta aatccatgcg tatcggtccg ggtcagacct 2820
tctacgctac cggtgacatc atcggtgaca tccgtcaggc ttactgcaac atctccggtt 2880
ccaaatggaa cgaaaccctg aaacgtgtta aagaaaaact gcaggaaaac tacaacaaca 2940
acaaaaccat caaattcgct ccgtcctccg gtggtgacct ggaaatcacc acccactcct 3000
tcaactgccg tggtgaattc ttctactgca acaccacccg tctgttcaac aacaacgcta 3060
ccgaagacga aaccatcacc ctgccgtgcc gtatcaaaca gatcatcaac atgtggcagg 3120
gtgttggtcg tgctatgtac gctccgccga tcgctggtaa catcacctgc aaatccaaca 3180

tcaccggtct gctgctggtt cgtgacggtg gtgaagacaa caaaaccgaa gaaatcttcc 3240
gtccgggtgg tggtaacatg aaagacaact ggcgttccga actgtacaaa tacaaagtta 3300
tcgaactgaa accgctgggt atcgctccga ccggtgctaa gcttaccgtt caggctcgtc 3360
agctgctgtc ctccatcgtt cagcagcagt ccaacctgct gcgtgctatc gaagctcagc 3420
agcacatgct gcagctgacc gtttggggta tcaaacagct gcagacccgt gttctggcta 3480
tcgaacgtta cctgaaagac cagcagctcg agatctggaa caacatgacc tggatggaat 3540
gggaccgtga aatctccaac tacaccgaca ccatctaccg tctgctggaa gactcccaga 3600
cccagcagga aaaaaacgaa aaagacctgc tggctctgga ctcctggaaa aacctgtggt 3660
cctggttcga catctccaac tggctgtggt acatcaaaat cttcatcatg atcgttggtg 3720
gtctgatcgg tctgcgtatc atcttcgctg ttctgtccat ctgaggatcc agatctgctg 3780
tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg 3840
aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga 3900
gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg 3960
aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga 4020
attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac 4080
cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca tagctcagga 4140
gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca 4200
gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt 4260
aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga 4320
attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4380
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4440
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4500
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4560
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4620
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4680
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4740
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4800
acccccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4860
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4920
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4980
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 5040
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 5100
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 5160
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5220
cttcacctag atccttttaa attaaaaatg aagtttaaa tcaatctaaa gtatatatga 5280
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5340
tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag gtctgcctcg 5400
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5460
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5520
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5580
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5640
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5700
tgcaatttat tcatatcagg attatcaata ccatatttttt gaaaaagccg tttctgtaat 5760
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5820
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5880
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5940
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 6000
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 6060
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 6120
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6180
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6240
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6300
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6360
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6420
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6480

ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6540
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6600
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6660
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6720
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6780
ccctttcgtc 6790

<210> 143
<211> 6658
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 143
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220

ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2640
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2700
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2760
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2820
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2880
gtgaattctt ctactgcaac accacccgtc tgttcaacaa caacgctacc gaagacgaaa 2940
ccatcaccct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 3000
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 3060
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3120
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3180
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3240
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3300
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3360
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3420
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3480
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3540
tctccaactg gctgtggtac atcaaaatct tcatcatgat cgttggtggt ctgatcggtc 3600
tgcgtatcat cttcgctgtt ctgtccatct gaggatccag atctgctgtg ccttctagtt 3660
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3720
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3780
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3840
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3900
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3960
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 4020
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4080
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4140
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4200
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4260
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4320
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4380
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca 4440
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4500
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4560
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4620
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4680
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4740
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4800
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4860
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4920
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4980
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5040
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5100
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5160
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5220
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5280
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5340
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5400
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5460
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5520

caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5580
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5640
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5700
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5760
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5820
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5880
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5940
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6000
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 6060
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6120
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6180
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6240
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6300
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6360
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6420
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6480
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6540
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6600
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6658

<210> 144
<211> 6577
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 144
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440

catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2640
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2700
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2760
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2820
ccacccgtct gttcaacaac aacgctaccg aagacgaaac catcaccctg ccgtgccgta 2880
tcaaacagat catcaacatg tggcagggtg ttggtcgtgc tatgtacgct ccgccgatcg 2940
ctggtaacat cacctgcaaa tccaacatca ccggtctgct gctggttcgt gacggtggtg 3000
aagacaacaa aaccgaagaa atcttccgtc cgggtggtgg taacatgaaa gacaactggc 3060
gttccgaact gtacaaatac aaagttatcg aactgaaacc gctgggtatc gctccgaccg 3120
gtgctaagct taccgttcag gctcgtcagc tgctgtcctc catcgttcag cagcagtcca 3180
acctgctgcg tgctatcgaa gctcagcagc acatgctgca gctgaccgtt tggggtatca 3240
aacagctgca gacccgtgtt ctggctatcg aacgttacct gaaagaccag cagctcgaga 3300
tctggaacaa catgacctgg atggaatggg accgtgaaat ctccaactac accgacacca 3360
tctaccgtct gctggaagac tcccagaccc agcaggaaaa aaacgaaaaa gacctgctgg 3420
ctctggactc ctggaaaaac ctgtggtcct ggttcgacat ctccaactgg ctgtggtaca 3480
tcaaaatctt catcatgatc gttggtggtc tgatcggtct gcgtatcatc ttcgctgttc 3540
tgtccatctg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3600
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3660
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3720
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3780
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3840
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 3900
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 3960
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4020
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4080
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4140
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4200
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4260
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4320
ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac gctcaagtca 4380
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4440
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4500
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4560
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4620
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4680
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4740

gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4800
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4860
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4920
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 4980
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5040
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5100
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5160
gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5220
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5280
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5340
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5400
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5460
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5520
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5580
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5640
aatttccgct cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5700
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5760
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5820
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5880
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 5940
tctaatacct ggaatgctgt tttcccgggg atcgcagtgg tgagtaacca tgcatcatca 6000
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6060
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6120
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6180
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6240
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6300
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6360
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6420
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6480
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6540
acctataaaa ataggcgtat cacgaggccc tttcgtc 6577

<210> 145
<211> 6538
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 145
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720

catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2640
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2700
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2760
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2820
ccgctagcct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 2880
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 2940
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3000
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3060
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3120
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3180
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3240
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3300
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3360
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3420
tctccaactg gctgtggtac atcaaaatct tcatcatgat cgttggtggt ctgatcggtc 3480
tgcgtatcat cttcgctgtt ctgtccatct gaggatccag atctgctgtg ccttctagtt 3540
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3600
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3660
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3720
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3780
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3840
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 3900
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 3960
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4020

agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4080
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4140
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4200
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4260
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgcccccctg acgagcatca 4320
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4380
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4440
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4500
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4560
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4620
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4680
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4740
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4800
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4860
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 4920
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 4980
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5040
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5100
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5160
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5220
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5280
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5340
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5400
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5460
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5520
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5580
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5640
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5700
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5760
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5820
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 5880
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccgggg gatcgcagtg 5940
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6000
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6060
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6120
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6180
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6240
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6300
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6360
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6420
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6480
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6538

<210> 146
<211> 6718
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 146
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60

cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2700
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2760
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2820
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2880
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2940
gtgaattctt ctactgcaac accacccgtc tgttcaacaa caacgctacc gaagacgaaa 3000
ccatcaccct gccgtgccgt atcaaaacaga tcatcaacat gtggcagggt gttggtcgtg 3060
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 3120
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3180
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3240
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3300
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3360

agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3420
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3480
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3540
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3600
tctccaactg gctgtggtac atcaaaatct tcatcatgat cgttggtggt ctgatcggtc 3660
tgcgtatcat cttcgctgtt ctgtccatct gaggatccag atctgctgtg ccttctagtt 3720
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3780
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3840
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3900
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3960
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 4020
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 4080
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4140
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4200
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4260
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4320
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4380
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4440
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca 4500
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4560
gtttcccct ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4620
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4680
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac ccccgttca 4740
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4800
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4860
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4920
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4980
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 5040
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 5100
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5160
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5220
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5280
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5340
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5400
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5460
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5520
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5580
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5640
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5700
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5760
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5820
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5880
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5940
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 6000
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 6060
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttccgggg gatcgcagtg 6120
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6180
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6240
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6300
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6360
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6420
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6480
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttcccccccc cccccattat 6540
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6600
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6660

accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc 6718

<210> 147
<211> 6637
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 147
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520

gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2700
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2760
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2820
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2880
ccacccgtct gttcaacaac aacgctaccg aagacgaaac catcaccctg ccgtgccgta 2940
tcaaacagat catcaacatg tggcagggtg ttggtcgtgc tatgtacgct ccgccgatcg 3000
ctggtaacat cacctgcaaa tccaacatca ccggtctgct gctggttcgt gacggtggtg 3060
aagacaacaa aaccgaagaa atcttccgtc cgggtggtgg taacatgaaa gacaactggc 3120
gttccgaact gtacaaatac aaagttatcg aactgaaacc gctgggtatc gctccgaccg 3180
gtgctaagct taccgttcag gctcgtcagc tgctgtcctc catcgttcag cagcagtcca 3240
acctgctgcg tgctatcgaa gctcagcagc acatgctgca gctgaccgtt tggggtatca 3300
aacagctgca gacccgtgtt ctggctatcg aacgttacct gaaagaccag cagctcgaga 3360
tctggaacaa catgacctgg atggaatggg accgtgaaat ctccaactac accgacacca 3420
tctaccgtct gctggaagac tcccagaccc agcaggaaaa aaacgaaaaa gacctgctgg 3480
ctctggactc ctggaaaaac ctgtggtcct ggttcgacat ctccaactgg ctgtggtaca 3540
tcaaaatctt catcatgatc gttggtggtc tgatcggtct gcgtatcatc ttcgctgttc 3600
tgtccatctg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3660
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3720
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3780
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3840
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3900
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 3960
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 4020
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4080
gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4140
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4200
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4260
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4320
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4380
ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac gctcaagtca 4440
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4500
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4560
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4620
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4680
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4740
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4800
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4860
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4920
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4980
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 5040
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5100
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5160
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5220
ggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5280
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5340
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5400
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5460
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5520
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5580
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5640
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5700
aatttccct cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5760
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5820

ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5880
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5940
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 6000
tctaatacct ggaatgctgt tttccgcggg atcgcagtgg tgagtaacca tgcatcatca 6060
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6120
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6180
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6240
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6300
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6360
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6420
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6480
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6540
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6600
acctataaaa ataggcgtat cacgaggccc tttcgtc 6637

<210> 148
<211> 6598
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 148
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtg 2700
ctagcgctta ctgcaacatc tccggttcca aatggaacga aaccctgaaa cgtgttaaag 2760
aaaaactgca ggaaaactac aacaacaaca aaaccatcaa attcgctccg tcctccggtg 2820
gtgacctgga aatcaccacc cactccttca actgccgtgg tgaattcttc tactgcaaca 2880
ccgctagcct gccgtgccgt atcaaacaga tcatcaacat gtggcagggt gttggtcgtg 2940
ctatgtacgc tccgccgatc gctggtaaca tcacctgcaa atccaacatc accggtctgc 3000
tgctggttcg tgacggtggt gaagacaaca aaaccgaaga aatcttccgt ccgggtggtg 3060
gtaacatgaa agacaactgg cgttccgaac tgtacaaata caaagttatc gaactgaaac 3120
cgctgggtat cgctccgacc ggtgctaagc ttaccgttca ggctcgtcag ctgctgtcct 3180
ccatcgttca gcagcagtcc aacctgctgc gtgctatcga agctcagcag cacatgctgc 3240
agctgaccgt ttggggtatc aaacagctgc agacccgtgt tctggctatc gaacgttacc 3300
tgaaagacca gcagctcgag atctggaaca acatgacctg gatggaatgg gaccgtgaaa 3360
tctccaacta caccgacacc atctaccgtc tgctggaaga ctcccagacc cagcaggaaa 3420
aaaacgaaaa agacctgctg gctctggact cctggaaaaa cctgtggtcc tggttcgaca 3480
tctccaactg gctgtggtac atcaaaatct tcatcatgat cgttggtggt ctgatcggtc 3540
tgcgtatcat cttcgctgtt ctgtccatct gaggatccag atctgctgtg ccttctagtt 3600
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 3660
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 3720
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 3780
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 3840
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 3900
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 3960
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 4020
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 4080
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 4140
tgatttaagg ccatcatggc cttaatcttc cgcttcctcg ctcactgact cgctgcgctc 4200
ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac 4260
agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa 4320
ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccccctg acgagcatca 4380
caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc 4440
gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata 4500
cctgtccgcc tttctccctt cgggaagcgt ggcgctttct catagctcac gctgtaggta 4560
tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac cccccgttca 4620
gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga 4680
cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg 4740
tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagaa cagtatttgg 4800
tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg 4860
caaacaaacc accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag 4920
aaaaaaagga tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa 4980
cgaaaactca cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat 5040

```
ccttttaaat taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc 5100
tgacagttac caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc 5160
atccatagtt gcctgactcg gggggggggg gcgctgaggt ctgcctcgtg aagaaggtgt 5220
tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga gggagccacg 5280
gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt gctttgccac 5340
ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag caaaagttcg 5400
atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca gtgttacaac 5460
caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg caatttattc 5520
atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga aggagaaaac 5580
tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat tccgactcgt 5640
ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc aagtgagaaa 5700
tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat ttctttccag 5760
acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc aaccaaaccg 5820
ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt aaaaggacaa 5880
ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc aacaatattt 5940
tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg gatcgcagtg 6000
gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg aagaggcata 6060
aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc aacgctacct 6120
ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg atagattgtc 6180
gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc agcatccatg 6240
ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct cataacaccc 6300
cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat atttttatct 6360
tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc cccccattat 6420
tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg tatttagaaa 6480
aataaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga cgtctaagaa 6540
accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc ctttcgtc   6598
```

<210> 149
<211> 6679
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 149

```
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
```

tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcgc atgcatcaac tgcaacgctt 2400
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2460
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2520
gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2580
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2640
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2700
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2760
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2820
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2880
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2940
gtgaattctt ctactgcaac accgctagcc tgccgtgccg tatcaaacag atcatcaaca 3000
tgtggcaggg tgttggtcgt gctatgtacg ctccgccgat cgctggtaac atcacctgca 3060
aatccaacat caccggtctg ctgctggttc gtgacggtgg tgaagacaac aaaaccgaag 3120
aaatcttccg tccgggtggt ggtaacatga aagacaactg gcgttccgaa ctgtacaaat 3180
acaaagttat cgaactgaaa ccgctgggta tcgctccgac cggtgctaag cttaccgttc 3240
aggctcgtca gctgctgtcc tccatcgttc agcagcagtc caacctgctg cgtgctatcg 3300
aagctcagca gcacatgctg cagctgaccg tttggggtat caaacagctg cagacccgtg 3360
ttctggctat cgaacgttac ctgaaagacc agcagctcga gatctggaac aacatgacct 3420
ggatggaatg ggaccgtgaa atctccaact acaccgacac catctaccgt ctgctggaag 3480
actcccagac ccagcaggaa aaaaacgaaa aagacctgct ggctctggac tcctggaaaa 3540
acctgtggtc ctggttcgac atctccaact ggctgtggta catcaaaatc ttcatcatga 3600
tcgttggtgg tctgatcggt ctgcgtatca tcttcgctgt tctgtccatc tgaggatcca 3660
gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 3720
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3780
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 3840
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 3900
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 3960
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 4020
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 4080
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 4140
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4200
aatcatagaa ttttaaggcc atgatttaag gccatcatgg ccttaatctt ccgcttcctc 4260
gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa 4320

ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa 4380
aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct 4440
ccgccccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac 4500
aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc 4560
gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc 4620
tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg 4680
tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga 4740
gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta acaggattag 4800
cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta 4860
cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag 4920
agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg 4980
caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac 5040
ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc 5100
aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag 5160
tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc 5220
agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggggg ggcgctgagg 5280
tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag 5340
ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat 5400
tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc 5460
cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta 5520
atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc 5580
aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt 5640
ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat 5700
cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa 5760
ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa 5820
agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa 5880
tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg 5940
cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact 6000
gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct 6060
gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc 6120
ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta 6180
acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc 6240
ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac 6300
ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt 6360
tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt 6420
catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg 6480
ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac 6540
atatttgaat gtatttagaa aaataaacaa atagggggttc cgcgcacatt tccccgaaaa 6600
gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt 6660
atcacgaggc cctttcgtc 6679

<210> 150
<211> 6748
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 150
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180

accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaataca tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt gctagcgctt 2820
actgcaacat ctccggttcc aaatggaacg aaaccctgaa acgtgttaaa gaaaaactgc 2880
aggaaaacta caacaacaac aaaaccatca aattcgctcc gtcctccggt ggtgacctgg 2940
aaatcaccac ccactccttc aactgccgtg gtgaattctt ctactgcaac accacccgtc 3000
tgttcaacaa caacgctacc gaagacgaaa ccatcaccct gccgtgccgt atcaaacaga 3060
tcatcaacat gtggcagggt gttggtcgtg ctatgtacgc tccgccgatc gctggtaaca 3120
tcacctgcaa atccaacatc accggtctgc tgctggttcg tgacggtggt gaagacaaca 3180
aaaccgaaga aatcttccgt ccgggtggtg gtaacatgaa agacaactgg cgttccgaac 3240
tgtacaaata caaagttatc gaactgaaac cgctgggtat cgctccgacc ggtgctaagc 3300
ttaccgttca ggctcgtcag ctgctgtcct ccatcgttca gcagcagtcc aacctgctgc 3360
gtgctatcga agctcagcag cacatgctgc agctgaccgt ttggggtatc aaacagctgc 3420
agacccgtgt tctggctatc gaacgttacc tgaaagacca gcagctcgag atctggaaca 3480

acatgacctg gatggaatgg gaccgtgaaa tctccaacta caccgacacc atctaccgtc 3540
tgctggaaga ctcccagacc cagcaggaaa aaaacgaaaa agacctgctg gctctggact 3600
cctggaaaaa cctgtggtcc tggttcgaca tctccaactg gctgtggtac atcaaaatct 3660
tcatcatgat cgttggtggt ctgatcggtc tgcgtatcat cttcgctgtt ctgtccatct 3720
gaggatccag atctgctgtg ccttctagtt gccagccatc tgttgtttgc ccctcccccg 3780
tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa aatgaggaaa 3840
ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg gggtggggtg gggcaggaca 3900
gcaaggggga ggattgggaa gacaatagca ggcatgctgg ggatgcggtg ggctctatgg 3960
gtacccaggt gctgaagaat tgacccggtt cctcctgggc cagaaagaag caggcacatc 4020
cccttctctg tgacacaccc tgtccacgcc cctggttctt agttccagcc ccactcatag 4080
gacactcata gctcaggagg gctccgcctt caatcccacc cgctaaagta cttggagcgg 4140
tctctccctc cctcatcagc ccaccaaacc aaacctagcc tccaagagtg ggaagaaatt 4200
aaagcaagat aggctattaa gtgcagaggg agagaaaatg cctccaacat gtgaggaagt 4260
aatgagagaa atcatagaat tttaaggcca tgatttaagg ccatcatggc cttaatcttc 4320
cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc 4380
tcactcaaag gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat 4440
gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt 4500
ccataggctc cgccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg 4560
aaacccgaca ggactataaa gataccaggc gtttcccccc ggaagctccc tcgtgcgctc 4620
tcctgttccg accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt 4680
ggcgctttct catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa 4740
gctgggctgt gtgcacgaac ccccgttca gcccgaccgc tgcgccttat ccggtaacta 4800
tcgtcttgag tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa 4860
caggattagc agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa 4920
ctacggctac actagaagaa cagtatttgg tatctgcgct ctgctgaagc cagttacctt 4980
cggaaaaaga gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt 5040
ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat 5100
cttttctacg gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat 5160
gagattatca aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc 5220
aatctaaagt atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc 5280
acctatctca gcgatctgtc tatttcgttc atccatagtt gcctgactcg gggggggggg 5340
gcgctgaggt ctgcctcgtg aagaaggtgt tgctgactca taccaggcct gaatcgcccc 5400
atcatccagc cagaaagtga gggagccacg gttgatgaga gctttgttgt aggtggacca 5460
gttggtgatt ttgaactttt gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt 5520
gatctgatcc ttcaactcag caaaagttcg atttattcaa caaagccgcc gtcccgtcaa 5580
gtcagcgtaa tgctctgcca gtgttacaac caattaacca attctgatta gaaaaactca 5640
tcgagcatca aatgaaactg caatttattc atatcaggat tatcaatacc atatttttga 5700
aaaagccgtt tctgtaatga aggagaaaac tcaccgaggc agttccatag gatggcaaga 5760
tcctggtatc ggtctgcgat tccgactcgt ccaacatcaa tacaacctat taatttcccc 5820
tcgtcaaaaa taaggttatc aagtgagaaa tcaccatgag tgacgactga atccggtgag 5880
aatggcaaaa gcttatgcat ttctttccag acttgttcaa caggccagcc attacgctcg 5940
tcatcaaaat cactcgcatc aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga 6000
cgaaatacgc gatcgctgtt aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc 6060
aggaacactg ccagcgcatc aacaatattt tcacctgaat caggatattc ttctaatacc 6120
tggaatgctg ttttcccggg gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg 6180
ataaaatgct tgatggtcgg aagaggcata aattccgtca gccagtttag tctgaccatc 6240
tcatctgtaa catcattggc aacgctacct ttgccatgtt tcagaaacaa ctctggcgca 6300
tcgggcttcc catacaatcg atagattgtc gcacctgatt gcccgacatt atcgcgagcc 6360
catttatacc catataaatc agcatccatg ttggaattta atcgcggcct cgagcaagac 6420
gtttcccgtt gaatatggct cataacaccc cttgtattac tgtttatgta agcagacagt 6480
tttattgttc atgatgatat atttttatct tgtgcaatgt aacatcagag attttgagac 6540
acaacgtggc tttccccccc cccccattat tgaagcattt atcagggtta ttgtctcatg 6600
agcggataca tatttgaatg tatttagaaa aataaacaaa taggggttcc gcgcacattt 6660
ccccgaaaag tgccacctga cgtctaagaa accattatta tcatgacatt aacctataaa 6720
aataggcgta tcacgaggcc ctttcgtc 6748

<210> 151
<211> 6709
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 151
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaataca tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580

gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt gctagcgctt 2820
actgcaacat ctccggttcc aaatggaacg aaaccctgaa acgtgttaaa gaaaaactgc 2880
aggaaaacta caacaacaac aaaaccatca aattcgctcc gtcctccggt ggtgacctgg 2940
aaatcaccac ccactccttc aactgccgtg gtgaattctt ctactgcaac accgctagcc 3000
tgccgtgccg tatcaaacag atcatcaaca tgtggcaggg tgttggtcgt gctatgtacg 3060
ctccgccgat cgctggtaac atcacctgca aatccaacat caccggtctg ctgctggttc 3120
gtgacggtgg tgaagacaac aaaaccgaag aaatcttccg tccgggtggt ggtaacatga 3180
aagacaactg gcgttccgaa ctgtacaaat acaaagttat cgaactgaaa ccgctgggta 3240
tcgctccgac cggtgctaag cttaccgttc aggctcgtca gctgctgtcc tccatcgttc 3300
agcagcagtc caacctgctg cgtgctatcg aagctcagca gcacatgctg cagctgaccg 3360
tttggggtat caaacagctg cagacccgtg ttctggctat cgaacgttac ctgaaagacc 3420
agcagctcga gatctggaac aacatgacct ggatggaatg ggaccgtgaa atctccaact 3480
acaccgacac catctaccgt ctgctggaag actcccagac ccagcaggaa aaaaacgaaa 3540
aagacctgct ggctctggac tcctggaaaa acctgtggtc ctggttcgac atctccaact 3600
ggctgtggta catcaaaatc ttcatcatga tcgttggtgg tctgatcggt ctgcgtatca 3660
tcttcgctgt tctgtccatc tgaggatcca gatctgctgt gccttctagt tgccagccat 3720
ctgttgtttg cccctccccc gtgccttcct tgaccctgga aggtgccact cccactgtcc 3780
tttcctaata aaatgaggaa attgcatcgc attgtctgag taggtgtcat tctattctgg 3840
ggggtggggt ggggcaggac agcaaggggg aggattggga agacaatagc aggcatgctg 3900
gggatgcggt gggctctatg ggtacccagg tgctgaagaa ttgacccggt tcctcctggg 3960
ccagaaagaa gcaggcacat ccccttctct gtgacacacc ctgtccacgc ccctggttct 4020
tagttccagc cccactcata ggacactcat agctcaggag ggctccgcct tcaatcccac 4080
ccgctaaagt acttggagcg gtctctccct ccctcatcag cccaccaaac caaacctagc 4140
ctccaagagt gggaagaaat taaagcaaga taggctatta agtgcagagg gagagaaaat 4200
gcctccaaca tgtgaggaag taatgagaga aatcatagaa ttttaaggcc atgatttaag 4260
gccatcatgg ccttaatctt ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg 4320
gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca cagaatcagg 4380
ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa 4440
ggccgcgttg ctggcgtttt tccataggct ccgccccccc gacgagcatc acaaaaatcg 4500
acgctcaagt cagaggtggc gaaacccgac aggactataa agataccagg cgtttccccc 4560
tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg cttaccggat acctgtccgc 4620
ctttctccct tcgggaagcg tggcgctttc tcatagctca cgctgtaggt atctcagttc 4680
ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa ccccccgttc agcccgaccg 4740
ctgcgcctta tccggtaact atcgtcttga gtccaacccg gtaagacacg acttatcgcc 4800
actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg gtgctacaga 4860
gttcttgaag tggtggccta actacggcta cactagaaga acagtatttg gtatctgcgc 4920
tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg gcaaacaaac 4980
caccgctggt agcggtggtt tttttgtttg caagcagcag attacgcgca gaaaaaaagg 5040
atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagtgga acgaaaactc 5100
acgttaaggg attttggtca tgagattatc aaaaaggatc ttcacctaga tccttttaaa 5160
ttaaaaatga agttttaaat caatctaaag tatatatgag taaacttggt ctgacagtta 5220
ccaatgctta atcagtgagg cacctatctc agcgatctgt ctatttcgtt catccatagt 5280
tgcctgactc ggggggggag ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc 5340
ataccaggcc tgaatcgccc catcatccag ccagaaagtg agggagccac ggttgatgag 5400
agctttgttg taggtggacc agttggtgat tttgaacttt tgctttgcca cggaacggtc 5460
tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca gcaaaagttc gatttattca 5520
acaaagccgc cgtcccgtca agtcagcgta atgctctgcc agtgttacaa ccaattaacc 5580
aattctgatt agaaaaactc atcgagcatc aaatgaaact gcaatttatt catatcagga 5640
ttatcaatac catatttttg aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg 5700
cagttccata ggatggcaag atcctggtat cggtctgcga ttccgactcg tccaacatca 5760
atacaaccta ttaatttccc ctcgtcaaaa ataaggttat caagtgagaa atcaccatga 5820
gtgacgactg aatccggtga gaatggcaaa agcttatgca tttctttcca gacttgttca 5880

acaggccagc cattacgctc gtcatcaaaa tcactcgcat caaccaaacc gttattcatt 5940
cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt taaaaggaca attacaaaca 6000
ggaatcgaat gcaaccggcg caggaacact gccagcgcat caacaatatt ttcacctgaa 6060
tcaggatatt cttctaatac ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac 6120
catgcatcat caggagtacg gataaaatgc ttgatggtcg gaagaggcat aaattccgtc 6180
agccagttta gtctgaccat ctcatctgta acatcattgg caacgctacc tttgccatgt 6240
ttcagaaaca actctggcgc atcgggcttc ccatacaatc gatagattgt cgcacctgat 6300
tgcccgacat tatcgcgagc ccatttatac ccatataaat cagcatccat gttggaattt 6360
aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc tcataacacc ccttgtatta 6420
ctgtttatgt aagcagacag ttttattgtt catgatgata tatttttatc ttgtgcaatg 6480
taacatcaga gattttgaga cacaacgtgg ctttcccccc ccccccatta ttgaagcatt 6540
tatcagggtt attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa 6600
ataggggttc cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt 6660
atcatgacat taacctataa aaataggcgt atcacgaggc cctttcgtc 6709

<210> 152
<211> 6790
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 152
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc taccttcaaa aacaacgtta 2340
ccaacgacat gaacaaagaa atccgtaact gctccttcaa caccaccacc gaaatccgtg 2400
acaaaaaaca gcagggttac gctctgttct accgtccgga catcgttctg ctgaaagaaa 2460
accgtaacaa ctccaacaac tccgaatacа tcctgatcaa ctgcaacgct tccaccatca 2520
cccaggcttg cccgaaagtt aacttcgacc cgatcccgat ccactactgc gctccggctg 2580
gttacgctat cctgaaatgc aacaacaaaa ccttctccgg taaaggtccg tgcaacaacg 2640
tttccaccgt tcagtgcacc catggtatca aaccggttgt ttccacccag ctgctgctga 2700
acggttccct ggctgaaaaa gaaatcatca tccgttccga aaacctgacc gacaacgtta 2760
aaaccatcat cgttcacctg aacaaatccg ttgaaatcgt ttgcacccgt ccgaacaaca 2820
acacccgtaa atccatgcgt atcggtccgg gtcagacctt ctacgctacc ggtgacatca 2880
tcggtgacat ccgtcaggct tactgcaaca tctccggttc caaatggaac gaaaccctga 2940
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 3000
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 3060
tctactgcaa caccgctagc ctgccgtgcc gtatcaaaca gatcatcaac atgtggcagg 3120
gtgttggtcg tgctatgtac gctccgccga tcgctggtaa catcacctgc aaatccaaca 3180
tcaccggtct gctgctggtt cgtgacggtg gtgaagacaa caaaaccgaa gaaatcttcc 3240
gtccgggtgg tggtaacatg aaagacaact ggcgttccga actgtacaaa tacaaagtta 3300
tcgaactgaa accgctgggt atcgctccga ccggtgctaa gcttaccgtt caggctcgtc 3360
agctgctgtc ctccatcgtt cagcagcagt ccaacctgct gcgtgctatc gaagctcagc 3420
agcacatgct gcagctgacc gtttggggta tcaaacagct gcagacccgt gttctggcta 3480
tcgaacgtta cctgaaagac cagcagctcg agatctggaa caacatgacc tggatggaat 3540
gggaccgtga aatctccaac tacaccgaca ccatctaccg tctgctggaa gactcccaga 3600
cccagcagga aaaaaacgaa aaagacctgc tggctctgga ctcctggaaa aacctgtggt 3660
cctggttcga catctccaac tggctgtggt acatcaaaat cttcatcatg atcgttggtg 3720
gtctgatcgg tctgcgtatc atcttcgctg ttctgtccat ctgaggatcc agatctgctg 3780
tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg 3840
aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga 3900
gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg 3960
aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga 4020
attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac 4080
cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca tagctcagga 4140
gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca 4200
gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt 4260
aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga 4320
attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4380
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4440
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4500
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4560
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4620
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4680
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4740
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4800
acccccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4860
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4920
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4980
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 5040

ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 5100
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 5160
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5220
cttcacctag atccttttaa attaaaaatg aagttttaaa tcaatctaaa gtatatatga 5280
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5340
tctatttcgt tcatccatag ttgcctgact cgggggggg gggcgctgag gtctgcctcg 5400
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5460
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5520
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5580
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5640
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5700
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5760
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5820
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5880
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5940
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 6000
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 6060
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 6120
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6180
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6240
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6300
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6360
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6420
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6480
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6540
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6600
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6660
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6720
gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6780
ccctttcgtc 6790

<210> 153
<211> 6637
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 153
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780

cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tgctagcgct tactgcaaca tctccggttc caaatggaac gaaaccctga 2820
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 2880
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 2940
tctactgcaa caccacccgt ctgttcaaca acaacgctac cgaagacgaa accatcaccc 3000
tgccgtgccg tatcaaacag atcatcaaca tgtggcaggg tgttggtcgt gctatgtacg 3060
ctccgccgat cgctggtaac atcacctgca aatccaacat caccggtctg ctgctggttc 3120
gtgacggtgg tgaagacaac aaaaccgaag aaatcttccg tccgggtggt ggtaacatga 3180
aagacaactg gcgttccgaa ctgtacaaat acaaagttat cgaactgaaa ccgctgggta 3240
tcgctccgac cggtgctaag cttaccgttc aggctcgtca gctgctgtcc tccatcgttc 3300
agcagcagtc caacctgctg cgtgctatcg aagctcagca gcacatgctg cagctgaccg 3360
tttggggtat caaacagctg cagacccgtg ttctggctat cgaacgttac ctgaaagacc 3420
agcagctcga gatctggaac aacatgacct ggatggaatg ggaccgtgaa atctccaact 3480
acaccgacac catctaccgt ctgctggaag actcccagac ccagcaggaa aaaaacgaaa 3540
aagacctgct ggctctggac tcctggaaaa acctgtggtc ctggttcgac atctccaact 3600
ggctgtggtg aggatccaga tctgctgtgc cttctagttg ccagccatct gttgtttgcc 3660
cctcccccgt gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa 3720
atgaggaaat tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg 3780
ggcaggacag caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg 3840
gctctatggg tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc 3900
aggcacatcc ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc 3960
cactcatagg acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac 4020
ttggagcggt ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg 4080

gaagaaatta aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg 4140
tgaggaagta atgagagaaa tcatagaatt ttaaggccat gatttaaggc catcatggcc 4200
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 4260
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 4320
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 4380
ggcgtttttc cataggctcc gccccctga cgagcatcac aaaaatcgac gctcaagtca 4440
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 4500
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 4560
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 4620
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 4680
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 4740
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 4800
gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 4860
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 4920
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 4980
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 5040
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 5100
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 5160
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 5220
ggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 5280
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 5340
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 5400
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 5460
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 5520
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 5580
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 5640
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 5700
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 5760
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 5820
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 5880
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 5940
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 6000
tctaatacct ggaatgctgt tttccgggg atcgcagtgg tgagtaacca tgcatcatca 6060
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 6120
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 6180
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 6240
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 6300
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 6360
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 6420
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 6480
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 6540
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 6600
acctataaaa ataggcgtat cacgaggccc tttcgtc 6637

<210> 154
<211> 6670
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 154

tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tgctagcgct tactgcaaca tctccggttc caaatggaac gaaaccctga 2820
aacgtgttaa agaaaaactg caggaaaact acaacaacaa caaaaccatc aaattcgctc 2880
cgtcctccgg tggtgacctg gaaatcacca cccactcctt caactgccgt ggtgaattct 2940
tctactgcaa caccgctagc ctgccgtgcc gtatcaaaca gatcatcaac atgtggcagg 3000
gtgttggtcg tgctatgtac gctccgccga tcgctggtaa catcacctgc aaatccaaca 3060
tcaccggtct gctgctggtt cgtgacggtg gtgaagacaa caaaaccgaa gaaatcttcc 3120
gtccgggtgg tggtaacatg aaagacaact ggcgttccga actgtacaaa tacaaagtta 3180
tcgaactgaa accgctgggt atcgctccga ccggtgctaa gcttaccgtt caggctcgtc 3240
agctgctgtc ctccatcgtt cagcagcagt ccaacctgct gcgtgctatc gaagctcagc 3300

agcacatgct gcagctgacc gtttggggta tcaaacagct gcagacccgt gttctggcta 3360
tcgaacgtta cctgaaagac cagcagctcg agatctggaa caacatgacc tggatggaat 3420
gggaccgtga aatctccaac tacaccgaca ccatctaccg tctgctggaa gactcccaga 3480
cccagcagga aaaaaacgaa aaagacctgc tggctctgga ctcctggaaa aacctgtggt 3540
cctggttcga catctccaac tggctgtggt acatcaaaat cttcatcatg atcgttggtg 3600
gtctgatcgg tctgcgtatc atcttcgctg ttctgtccat ctgaggatcc agatctgctg 3660
tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg 3720
aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg cattgtctga 3780
gtaggtgtca ttctattctg gggggtgggg tggggcagga cagcaagggg gaggattggg 3840
aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag gtgctgaaga 3900
attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc tgtgacacac 3960
cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca tagctcagga 4020
gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc tccctcatca 4080
gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag ataggctatt 4140
aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag aaatcataga 4200
attttaaggc catgatttaa ggccatcatg gccttaatct tccgcttcct cgctcactga 4260
ctcgctgcgc tcggtcgttc ggctgcggcg agcggtatca gctcactcaa aggcggtaat 4320
acggttatcc acagaatcag gggataacgc aggaaagaac atgtgagcaa aaggccagca 4380
aaaggccagg aaccgtaaaa aggccgcgtt gctggcgttt ttccataggc tccgcccccc 4440
tgacgagcat cacaaaaatc gacgctcaag tcagaggtgg cgaaacccga caggactata 4500
aagataccag gcgtttcccc ctggaagctc cctcgtgcgc tctcctgttc cgaccctgcc 4560
gcttaccgga tacctgtccg cctttctccc ttcgggaagc gtggcgcttt ctcatagctc 4620
acgctgtagg tatctcagtt cggtgtaggt cgttcgctcc aagctgggct gtgtgcacga 4680
acccccccgtt cagcccgacc gctgcgcctt atccggtaac tatcgtcttg agtccaaccc 4740
ggtaagacac gacttatcgc cactggcagc agccactggt aacaggatta gcagagcgag 4800
gtatgtaggc ggtgctacag agttcttgaa gtggtggcct aactacggct acactagaag 4860
aacagtattt ggtatctgcg ctctgctgaa gccagttacc ttcggaaaaa gagttggtag 4920
ctcttgatcc ggcaaacaaa ccaccgctgg tagcggtggt ttttttgttt gcaagcagca 4980
gattacgcgc agaaaaaaag gatctcaaga agatcctttg atcttttcta cggggtctga 5040
cgctcagtgg aacgaaaact cacgttaagg gattttggtc atgagattat caaaaaggat 5100
cttcacctag atcctttttaa attaaaaatg aagtttttaaa tcaatctaaa gtatatatga 5160
gtaaacttgg tctgacagtt accaatgctt aatcagtgag gcacctatct cagcgatctg 5220
tctatttcgt tcatccatag ttgcctgact cgggggggggg gggcgctgag gtctgcctcg 5280
tgaagaaggt gttgctgact cataccaggc ctgaatcgcc ccatcatcca gccagaaagt 5340
gagggagcca cggttgatga gagctttgtt gtaggtggac cagttggtga ttttgaactt 5400
ttgctttgcc acggaacggt ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc 5460
agcaaaagtt cgatttattc aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc 5520
cagtgttaca accaattaac caattctgat tagaaaaact catcgagcat caaatgaaac 5580
tgcaatttat tcatatcagg attatcaata ccatattttt gaaaaagccg tttctgtaat 5640
gaaggagaaa actcaccgag gcagttccat aggatggcaa gatcctggta tcggtctgcg 5700
attccgactc gtccaacatc aatacaacct attaatttcc cctcgtcaaa aataaggtta 5760
tcaagtgaga aatcaccatg agtgacgact gaatccggtg agaatggcaa aagcttatgc 5820
atttctttcc agacttgttc aacaggccag ccattacgct cgtcatcaaa atcactcgca 5880
tcaaccaaac cgttattcat tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg 5940
ttaaaaggac aattacaaac aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca 6000
tcaacaatat tttcacctga atcaggatat tcttctaata cctggaatgc tgttttcccg 6060
gggatcgcag tggtgagtaa ccatgcatca tcaggagtac ggataaaatg cttgatggtc 6120
ggaagaggca taaattccgt cagccagttt agtctgacca tctcatctgt aacatcattg 6180
gcaacgctac ctttgccatg tttcagaaac aactctggcg catcgggctt cccatacaat 6240
cgatagattg tcgcacctga ttgcccgaca ttatcgcgag cccatttata cccatataaa 6300
tcagcatcca tgttggaatt taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg 6360
ctcataacac cccttgtatt actgtttatg taagcagaca gttttattgt tcatgatgat 6420
atatttttat cttgtgcaat gtaacatcag agattttgag acacaacgtg gctttccccc 6480
ccccccccatt attgaagcat ttatcagggt tattgtctca tgagcggata catatttgaa 6540
tgtatttaga aaaataaaca aatagggggtt ccgcgcacat ttccccgaaa agtgccacct 6600

gacgtctaag aaaccattat tatcatgaca ttaacctata aaaataggcg tatcacgagg 6660
ccctttcgtc 6670

<210> 155
<211> 6547
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 155
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagcatcaac tgcaacgctt 2340
ccaccatcac ccaggcttgc ccgaaagtta acttcgaccc gatcccgatc cactactgcg 2400
ctccggctgg ttacgctatc ctgaaatgca acaacaaaac cttctccggt aaaggtccgt 2460

gcaacaacgt ttccaccgtt cagtgcaccc atggtatcaa accggttgtt tccacccagc 2520
tgctgctgaa cggttccctg gctgaaaaag aaatcatcat ccgttccgaa aacctgaccg 2580
acaacgttaa aaccatcatc gttcacctga acaaatccgt tgaaatcgtt tgcacccgtc 2640
cgaacaacaa cacccgtaaa tccatgcgta tcggtccggg tcagaccttc tacgctaccg 2700
gtgacatcat cggtgacatc cgtcaggctt actgcaacat ctccggttcc aaatggaacg 2760
aaaccctgaa acgtgttaaa gaaaaactgc aggaaaacta caacaacaac aaaaccatca 2820
aattcgctcc gtcctccggt ggtgacctgg aaatcaccac ccactccttc aactgccgtg 2880
gtgaattctt ctactgcaac accgctagcc tgccgtgccg tatcaaacag atcatcaaca 2940
tgtggcaggg tgttggtcgt gctatgtacg ctccgccgat cgctggtaac atcacctgca 3000
aatccaacat caccggtctg ctgctggttc gtgacggtgg tgaagacaac aaaaccgaag 3060
aaatcttccg tccgggtggt ggtaacatga aagacaactg gcgttccgaa ctgtacaaat 3120
acaaagttat cgaactgaaa ccgctgggta tcgctccgac cggtgctaag cttaccgttc 3180
aggctcgtca gctgctgtcc tccatcgttc agcagcagtc caacctgctg cgtgctatcg 3240
aagctcagca gcacatgctg cagctgaccg tttggggtat caaacagctg cagacccgtg 3300
ttctggctat cgaacgttac ctgaaagacc agcagctcga gatctggaac aacatgacct 3360
ggatggaatg ggaccgtgaa atctccaact acaccgacac catctaccgt ctgctggaag 3420
actcccagac ccagcaggaa aaaaacgaaa aagacctgct ggctctggac tcctggaaaa 3480
acctgtggtc ctggttcgac atctccaact ggctgtggtg aggatccaga tctgctgtgc 3540
cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg accctggaag 3600
gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat tgtctgagta 3660
ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag gattgggaag 3720
acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg ctgaagaatt 3780
gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt gacacaccct 3840
gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag ctcaggaggg 3900
ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc ctcatcagcc 3960
caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata ggctattaag 4020
tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa tcatagaatt 4080
ttaaggccat gatttaaggc catcatggcc ttaatcttcc gcttcctcgc tcactgactc 4140
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 4200
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 4260
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gcccccctga 4320
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 4380
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 4440
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc atagctcacg 4500
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 4560
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 4620
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 4680
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaagaac 4740
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 4800
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 4860
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 4920
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 4980
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 5040
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 5100
atttcgttca tccatagttg cctgactccg gggggggggg cgctgaggtc tgcctcgtga 5160
agaaggtgtt gctgactcat accaggcctg aatcgcccca tcatccagcc agaaagtgag 5220
ggagccacgg ttgatgagag ctttgttgta ggtggaccag ttggtgattt tgaacttttg 5280
ctttgccacg gaacggtctg cgttgtcggg aagatgcgtg atctgatcct tcaactcagc 5340
aaaagttcga tttattcaac aaagccgccg tcccgtcaag tcagcgtaat gctctgccag 5400
tgttacaacc aattaaccaa ttctgattag aaaaactcat cgagcatcaa atgaaactgc 5460
aatttattca tatcaggatt atcaatacca tatttttgaa aaagccgttt ctgtaatgaa 5520
ggagaaaact caccgaggca gttccatagg atggcaagat cctggtatcg gtctgcgatt 5580
ccgactcgtc caacatcaat acaacctatt aatttccccc cgtcaaaaat aaggttatca 5640
agtgagaaat caccatgagt gacgactgaa tccggtgaga atggcaaaag cttatgcatt 5700
tctttccaga cttgttcaac aggccagcca ttacgctcgt catcaaaatc actcgcatca 5760

accaaaccgt tattcattcg tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta 5820
aaaggacaat tacaaacagg aatcgaatgc aaccggcgca ggaacactgc cagcgcatca 5880
acaatatttt cacctgaatc aggatattct tctaatacct ggaatgctgt tttccgcggg 5940
atcgcagtgg tgagtaacca tgcatcatca ggagtacgga taaaatgctt gatggtcgga 6000
agaggcataa attccgtcag ccagtttagt ctgaccatct catctgtaac atcattggca 6060
acgctacctt tgccatgttt cagaaacaac tctggcgcat cgggcttccc atacaatcga 6120
tagattgtcg cacctgattg cccgacatta tcgcgagccc atttataccc atataaatca 6180
gcatccatgt tggaatttaa tcgcggcctc gagcaagacg tttcccgttg aatatggctc 6240
ataacacccc ttgtattact gtttatgtaa gcagacagtt ttattgttca tgatgatata 6300
tttttatctt gtgcaatgta acatcagaga ttttgagaca caacgtggct ttcccccccc 6360
ccccattatt gaagcattta tcagggttat tgtctcatga gcggatacat atttgaatgt 6420
atttagaaaa ataaacaaat aggggttccg cgcacatttc cccgaaaagt gccacctgac 6480
gtctaagaaa ccattattat catgacatta acctataaaa ataggcgtat cacgaggccc 6540
tttcgtc 6547

<210> 156
<211> 6679
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 156
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca cgtgtgatca gatatcgcgg ccgctctaga gatatcgcca 1920
ccatgcgtgt tcgtggtatc ccgcgtaact ggccgcagtg gtggatgtgg ggtatcctgg 1980
gtttctggat gatcatcatc tgccgtgttg ttggtaacat gtgggttacc gtttactacg 2040
gtgttccggt ttggaccgac gctaaaacca ccctgttctg cgcttccgac accaaagcct 2100
acgaccgtga agttcacaac gtttgggcta cccacgcttg cgttccgacc gacccgaacc 2160
cgcaggaaat cgttctggaa aacgttaccg aaaacttcaa catgtggaaa aacgacatgg 2220
ttgaccagat gcacgaagac atcatctccc tgtgggacca gtccctgaaa ccgtgcgtta 2280
aactgacccc gctgtgcgtt accctgcact gcaccaacgc tagccgtaac tgctccttca 2340
acaccaccac cgaaatccgt gacaaaaaac agcagggtta cgctctgttc taccgtccgg 2400
acatcgttct gctgaaagaa aaccgtaaca actccaacaa ctccgaatac atcctgatca 2460
actgcaacgc ttccaccatc acccaggctt gcccgaaagt taacttcgac ccgatcccga 2520
tccactactg cgctccggct ggttacgcta tcctgaaatg caacaacaaa accttctccg 2580
gtaaaggtcc gtgcaacaac gtttccaccg ttcagtgcac ccatggtatc aaaccggttg 2640
tttccaccca gctgctgctg aacggttccc tggctgaaaa agaaatcatc atccgttccg 2700
aaaacctgac cgacaacgtt aaaaccatca tcgttcacct gaacaaatcc gttgaaatcg 2760
tttgcacccg tccgaacaac aacacccgta aatccatgcg tatcggtccg ggtcagacct 2820
tctacgctac cggtgacatc atcggtgaca tccgtcaggc ttactgcaac atctccggtt 2880
ccaaatggaa cgaaaccctg aaacgtgtta aagaaaaact gcaggaaaac tacaacaaca 2940
acaaaaccat caaattcgct ccgtcctccg gtggtgacct ggaaatcacc acccactcct 3000
tcaactgccg tggtgaattc ttctactgca acaccgctag cctgccgtgc cgtatcaaac 3060
agatcatcaa catgtggcag ggtgttggtc gtgctatgta cgctccgccg atcgctggta 3120
acatcacctg caaatccaac atcaccggtc tgctgctggt tcgtgacggt ggtgaagaca 3180
acaaaaccga agaaatcttc cgtccgggtg gtggtaacat gaaagacaac tggcgttccg 3240
aactgtacaa atacaaagtt atcgaactga aaccgctggg tatcgctccg accggtgcta 3300
agcttaccgt tcaggctcgt cagctgctgt cctccatcgt tcagcagcag tccaacctgc 3360
tgcgtgctat cgaagctcag cagcacatgc tgcagctgac cgtttggggt atcaaacagc 3420
tgcagacccg tgttctggct atcgaacgtt acctgaaaga ccagcagctc gagatctgga 3480
acaacatgac ctggatggaa tgggaccgtg aaatctccaa ctacaccgac accatctacc 3540
gtctgctgga agactcccag acccagcagg aaaaaaacga aaaagacctg ctggctctgg 3600
actcctggaa aaacctgtgg tcctggttcg acatctccaa ctggctgtgg tgaggatcca 3660
gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 3720
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3780
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 3840
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 3900
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 3960
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 4020
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 4080
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 4140
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4200
aatcatagaa ttttaaggcc atgatttaag gccatcatgg ccttaatctt ccgcttcctc 4260
gctcactgac tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa 4320
ggcggtaata cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa 4380
aggccagcaa aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct 4440
ccgccccct gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac 4500
aggactataa agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc 4560
gaccctgccg cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc 4620
tcatagctca cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg 4680
tgtgcacgaa ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga 4740
gtccaacccg gtaagacacg acttatcgcc actggcagca gccactggta acaggattag 4800
cagagcgagg tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta 4860
cactagaaga acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag 4920
agttggtagc tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg 4980
caagcagcag attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac 5040

ggggtctgac gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc 5100
aaaaaggatc ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag 5160
tatatatgag taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc 5220
agcgatctgt ctatttcgtt catccatagt tgcctgactc ggggggggag ggcgctgagg 5280
tctgcctcgt gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag 5340
ccagaaagtg agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat 5400
tttgaacttt tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc 5460
cttcaactca gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta 5520
atgctctgcc agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc 5580
aaatgaaact gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt 5640
ttctgtaatg aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat 5700
cggtctgcga ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa 5760
ataaggttat caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa 5820
agcttatgca tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa 5880
tcactcgcat caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg 5940
cgatcgctgt taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact 6000
gccagcgcat caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct 6060
gttttcccgg ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc 6120
ttgatggtcg gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta 6180
acatcattgg caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc 6240
ccatacaatc gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac 6300
ccatataaat cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt 6360
tgaatatggc tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt 6420
catgatgata tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg 6480
ctttcccccc ccccccatta ttgaagcatt tatcagggtt attgtctcat gagcggatac 6540
atatttgaat gtatttagaa aaataaacaa ataggggttc cgcgcacatt tccccgaaaa 6600
gtgccacctg acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt 6660
atcacgaggc cctttcgtc 6679

<210> 157
<211> 6438
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 157
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900

agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgcccccg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaatttttt 3180
agggaagatc tggccttccc acaagggaag gccagggaat tttcttcaga gcagaccaga 3240
gccaacagcc ccaccagaag agagcttcag gtttggggaa gagacaacaa ctccctctca 3300
gaagcaggag ccgatagaca aggaactgta tcctttagct tccctcagat cactctttgg 3360
cagcgacccc tcgtcacaat aaagataggg ggccagctga aggaggccct tctagaccag 3420
gccctggatc cagatctgct gtgccttcta gttgccagcc atctgttgtt tgcccctccc 3480
ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa taaaatgagg 3540
aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg gtggggcagg 3600
acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg gtgggctcta 3660
tgggtaccca ggtgctgaag aattgacccg gttcctcctg ggccagaaag aagcaggcac 3720
atccccttct ctgtgacaca ccctgtccac gcccctggtt cttagttcca gccccactca 3780
taggacactc atagctcagg agggctccgc cttcaatccc acccgctaaa gtacttggag 3840
cggtctctcc ctcccctcatc agcccaccaa accaaaccta gcctccaaga gtgggaagaa 3900
attaaagcaa gataggctat taagtgcaga gggagagaaa atgcctccaa catgtgagga 3960
agtaatgaga gaaatcatag aattttaagg ccatcatggc cttaatcttc cgcttcctcg 4020
ctcactgact cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag 4080
gcggtaatac ggttatccac agaatcaggg gataacgcag gaaagaacat gtgagcaaaa 4140
ggccagcaaa aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc 4200

cgcccccctg acgagcatca caaaaatcga cgctcaagtc agaggtggcg aaacccgaca 4260
ggactataaa gataccaggc gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg 4320
accctgccgc ttaccggata cctgtccgcc tttctccctt cgggaagcgt ggcgctttct 4380
catagctcac gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt 4440
gtgcacgaac cccccgttca gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag 4500
tccaacccgg taagacacga cttatcgcca ctggcagcag ccactggtaa caggattagc 4560
agagcgaggt atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa ctacggctac 4620
actagaagaa cagtatttgg tatctgcgct ctgctgaagc cagttacctt cggaaaaaga 4680
gttggtagct cttgatccgg caaacaaacc accgctggta gcggtggttt ttttgtttgc 4740
aagcagcaga ttacgcgcag aaaaaaagga tctcaagaag atcctttgat cttttctacg 4800
gggtctgacg ctcagtggaa cgaaaactca cgttaaggga ttttggtcat gagattatca 4860
aaaaggatct tcacctagat ccttttaaat taaaaatgaa gttttaaatc aatctaaagt 4920
atatatgagt aaacttggtc tgacagttac caatgcttaa tcagtgaggc acctatctca 4980
gcgatctgtc tatttcgttc atccatagtt gcctgactcg gggggggggg gcgctgaggt 5040
ctgcctcgtg aagaaggtgt tgctgactca taccaggcct gaatcgcccc atcatccagc 5100
cagaaagtga gggagccacg gttgatgaga gctttgttgt aggtggacca gttggtgatt 5160
ttgaactttt gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc 5220
ttcaactcag caaaagttcg atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa 5280
tgctctgcca gtgttacaac caattaacca attctgatta gaaaaactca tcgagcatca 5340
aatgaaactg caatttattc atatcaggat tatcaatacc atatttttga aaaagccgtt 5400
tctgtaatga aggagaaaac tcaccgaggc agttccatag gatggcaaga tcctggtatc 5460
ggtctgcgat tccgactcgt ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa 5520
taaggttatc aagtgagaaa tcaccatgag tgacgactga atccggtgag aatggcaaaa 5580
gcttatgcat ttctttccag acttgttcaa caggccagcc attacgctcg tcatcaaaat 5640
cactcgcatc aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc 5700
gatcgctgtt aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc aggaacactg 5760
ccagcgcatc aacaatattt tcacctgaat caggatattc ttctaatacc tggaatgctg 5820
ttttcccggg gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg ataaaatgct 5880
tgatggtcgg aagaggcata aattccgtca gccagtttag tctgaccatc tcatctgtaa 5940
catcattggc aacgctacct ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc 6000
catacaatcg atagattgtc gcacctgatt gcccgacatt atcgcgagcc catttatacc 6060
catataaatc agcatccatg ttggaattta atcgcggcct cgagcaagac gtttcccgtt 6120
gaatatggct cataacaccc cttgtattac tgtttatgta agcagacagt tttattgttc 6180
atgatgatat atttttatct tgtgcaatgt aacatcagag attttgagac acaacgtggc 6240
tttccccccc cccccattat tgaagcattt atcagggtta ttgtctcatg agcggataca 6300
tatttgaatg tatttagaaa aataaacaaa taggggttcc gcgcacattt ccccgaaaag 6360
tgccacctga cgtctaagaa accattatta tcatgacatt aacctataaa aataggcgta 6420
tcacgaggcc ctttcgtc 6438

<210> 158
<211> 6486
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing SIV genes

<400> 158
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300

tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgacg ccgccaccat gggcgtgcgc aacagcgtgc tgagcggcaa 1920
gaaggccgac gagctggaga agatccgcct gcgcccgaac ggcaagaaga agtacatgct 1980
gaagcacgtg gtgtgggccg ccaacgagct ggaccgcttc ggcctggccg agagcctgct 2040
ggagaacaag gagggctgcc agaagatcct gagcgtgctg gcgccgctgg tgcccaccgg 2100
cagcgagaac ctgaagagcc tgtacaacac cgtgtgcgtg atctggtgca tccacgccga 2160
ggagaaggtg aagcacaccg aggaggccaa gcagatcgtg cagcgccacc tggtggtgga 2220
gaccggcacc accgagacca tgcccaagac cagccgcccg accgcgccca gcagcggacg 2280
cggcggcaac tacccggtgc agcagatcgg cggcaactac gtgcacctgc cgctgagccc 2340
gcgcaccctg aacgcctggg tgaagctgat cgaggagaag aagttcggcg ccgaggtggt 2400
gcccggcttc caggccctga gcgagggctg cacgccctac gacatcaacc agatgctgaa 2460
ctgcgtgggc gaccaccagg ccgccatgca gatcatccgc gacatcatca acgaggaggc 2520
cgccgactgg gacctgcagc acccgcagcc cgcgccgcag cagggccagc tgcgcgagcc 2580
cagcggcagc gacatcgccg gcaccaccag cagcgtggac gagcagatcc agtggatgta 2640
ccgccagcag aacccgatcc cggtgggcaa catctaccgc cgctggatac agctgggcct 2700
gcagaagtgc gtgcgcatgt acaacccgac caacatcctg gacgtgaagc agggcccgaa 2760
ggagcccttc cagagctacg tggaccgctt ctacaagagc ctgcgcgccg agcagaccga 2820
cgccgccgtg aagaactgga tgacccagac cctgctgatc cagaacgcca acccggactg 2880
caagctggtg ctgaagggcc tgggcgtgaa cccgaccctg gaggagatgc tgaccgcctg 2940
ccagggcgtg ggcggcccgg gccagaaggc ccgcctgatg gccgaggccc tgaaggaggc 3000
cctggcgccc gtgcccatcc cgttcgcggc cgcccagcag cgcggcccgc gcaagcccat 3060
caagtgctgg aactgcggca aggagggcca cagcgcccgc cagtgccgcg cgccgcgccg 3120
ccagggctgc tggaagtgcg gcaagatgga ccacgtgatg gccaagtgcc cggaccgcca 3180
ggcgggtttt ttaggccttg gtccatgggg aaagaagccg cgcaatttcc cgatggctca 3240
agtgcatcag gggctgatgc caactgctcc gccagaggac ccagctgtgg atctgctaaa 3300
gaactacatg cagttgggca agcagcagag agaaaagcag agagaaagca gagagaagcc 3360
ttacaaggag gtgacagagg atttgctgca cctcaattct ctctttggag gagaccagta 3420
gtcactgcat cgatcgaggg ccagcccgtg gaggtgcttc tagaccaggc cctggatcca 3480
gatctgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 3540
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 3600

attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcaggac agcaaggggg 3660
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 3720
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 3780
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 3840
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 3900
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 3960
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 4020
aatcatagaa ttttaaggcc atcatggcct taatcttccg cttcctcgct cactgactcg 4080
ctgcgctcgg tcgttcggct gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg 4140
ttatccacag aatcagggga taacgcagga aagaacatgt gagcaaaagg ccagcaaaag 4200
gccaggaacc gtaaaaaggc cgcgttgctg gcgtttttcc ataggctccg cccccctgac 4260
gagcatcaca aaaatcgacg ctcaagtcag aggtggcgaa acccgacagg actataaaga 4320
taccaggcgt ttcccccctgg aagctccctc gtgcgctctc ctgttccgac cctgccgctt 4380
accggatacc tgtccgcctt tctcccttcg ggaagcgtgg cgctttctca tagctcacgc 4440
tgtaggtatc tcagttcggt gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc 4500
cccgttcagc ccgaccgctg cgccttatcc ggtaactatc gtcttgagtc caacccggta 4560
agacacgact tatcgccact ggcagcagcc actggtaaca ggattagcag agcgaggtat 4620
gtaggcggtg ctacagagtt cttgaagtgg tggcctaact acggctacac tagaagaaca 4680
gtatttggta tctgcgctct gctgaagcca gttaccttcg gaaaaagagt tggtagctct 4740
tgatccggca aacaaaccac cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt 4800
acgcgcagaa aaaaaggatc tcaagaagat cctttgatct tttctacggg gtctgacgct 4860
cagtggaacg aaaactcacg ttaagggatt ttggtcatga gattatcaaa aaggatcttc 4920
acctagatcc ttttaaatta aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa 4980
acttggtctg acagttacca atgcttaatc agtgaggcac ctatctcagc gatctgtcta 5040
tttcgttcat ccatagttgc ctgactcggg gggggggggc gctgaggtct gcctcgtgaa 5100
gaaggtgttg ctgactcata ccaggcctga atcgccccat catccagcca gaaagtgagg 5160
gagccacggt tgatgagagc tttgttgtag gtggaccagt tggtgatttt gaacttttgc 5220
tttgccacgg aacggtctgc gttgtcggga agatgcgtga tctgatcctt caactcagca 5280
aaagttcgat ttattcaaca aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt 5340
gttacaacca attaaccaat tctgattaga aaaactcatc gagcatcaaa tgaaactgca 5400
atttattcat atcaggatta tcaataccat atttttgaaa aagccgtttc tgtaatgaag 5460
gagaaaactc accgaggcag ttccatagga tggcaagatc ctggtatcgg tctgcgattc 5520
cgactcgtcc aacatcaata caacctatta atttcccctc gtcaaaaata aggttatcaa 5580
gtgagaaatc accatgagtg acgactgaat ccggtgagaa tggcaaaagc ttatgcattt 5640
ctttccagac ttgttcaaca ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa 5700
ccaaaccgtt attcattcgt gattgcgcct gagcgagacg aaatacgcga tcgctgttaa 5760
aaggacaatt acaaacagga atcgaatgca accggcgcag gaacactgcc agcgcatcaa 5820
caatattttc acctgaatca ggatattctt ctaatacctg gaatgctgtt ttcccgggga 5880
tcgcagtggt gagtaaccat gcatcatcag gagtacggat aaaatgcttg atggtcggaa 5940
gaggcataaa ttccgtcagc cagtttagtc tgaccatctc atctgtaaca tcattggcaa 6000
cgctaccttt gccatgtttc agaaacaact ctggcgcatc gggcttccca tacaatcgat 6060
agattgtcgc acctgattgc ccgacattat cgcgagccca tttatacccа tataaatcag 6120
catccatgtt ggaatttaat cgcggcctcg agcaagacgt ttcccgttga atatggctca 6180
taacacccct tgtattactg tttatgtaag cagacagttt tattgttcat gatgatatat 6240
ttttatcttg tgcaatgtaa catcagagat tttgagacac aacgtggctt tcccccccc 6300
cccattattg aagcatttat cagggttatt gtctcatgag cggatacata tttgaatgta 6360
tttagaaaaa taaacaaata ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg 6420
tctaagaaac cattattatc atgacattaa cctataaaaa taggcgtatc acgaggccct 6480
ttcgtc 6486

<210> 159
<211> 9189
<212> DNA

<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 159
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt ccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgccccgg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940

cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaataggga 3180
agatctggcc ttcccacaag ggaaggccag ggaattttct tcagagcaga ccagagccaa 3240
cagccccacc agaagagagc ttcaggtttg gggaagagac aacaactccc tctcagaagc 3300
aggagccgat agacaaggaa ctgtatcctt tagcttccct cagatcactc tttggcagcg 3360
acccctcgtc acaataaaga taggggccca gctgaaggag gcccttctag acaccggcgc 3420
cgacgacacc gtgctggagg agatgaacct gcccggccgc tggaagccca agatgatcgg 3480
cggcatcggc ggcttcatca aggtgggcca gtacgaccag atcctgatcg agatctgcgg 3540
ccacaaggcc atcggcaccg tgctggtggg ccccaccccc gtgaacatca tcggccgcaa 3600
cctgctgacc cagatcggct gcaccctgaa cttccccatc agccccatcg agaccgtgcc 3660
cgtgaagctg aagcccggca tggacggccc caaggtgaag cagtggcccc tgaccgagga 3720
gaagatcaag gccctggtgg agatctgcac cgagatggag aaggagggca agatcagcaa 3780
gatcggcccc gagaacccct acaacacccc cgtgttcgcc atcaagaaga aggacagcac 3840
caagtggcgc aagctggtgg acttccgcga gctgaacaag cgcacccagg acttctggga 3900
ggtgcagctg ggcatccccc accccgccgg cctgaagcag aagaagagcg tgaccgtgct 3960
ggacgtgggc gacgcctact tcagcgtgcc cctggacaag gacttccgca agtacaccgc 4020
cttcaccatc cccagcatca acaacgagac ccccggcatc cgctaccagt acaacgtgct 4080
gccccagggc tggaagggca gccccgccat cttccagtgc agcatgacca agatcctgga 4140
gcccttccgc aagcagaacc ccgacatcgt gatctaccag tacatggacg acctgtacgt 4200
gggcagcgac ctggagatcg gccagcaccg caccaagatc gaggagctgc gccagcacct 4260
gctgcgctgg ggcttcacca cccccgacaa gaagcaccag aaggagcccc ccttcctgtg 4320
gatgggctac gagctgcacc ccgacaagtg gaccgtgcag cccatcgtgc tgcccgagaa 4380
ggacagctgg accgtgaacg acatccagaa gctggtgggc aagctgaact gggccagcca 4440
gatctacgcc ggcatcaagg tgcgccagct gtgcaagctg ctgcgcggca ccaaggccct 4500
gaccgaggtg gtgcccctga ccgaggaggc cgagctggag ctggccgaga accgcgagat 4560
cctgaaggag cccgtgcacg gcgtgtacta cgaccccagc aaggacctga tcgccgagat 4620
ccagaagcag ggccagggcc agtggaccta ccagatctac caggagccct tcaagaacct 4680
gaagaccggc aagtacgccc gcatgaaggg cgcccacacc aacgacgtga agcagctgac 4740
cgaggccgtg cagaagatcg ccaccgagag catcgtgatc tggggcaaga cccccaagtt 4800
caagctgccc atccagaagg agacctggga ggcctggtgg accgagtact ggcaggccac 4860
ctggatcccc gagtgggagt tcgtgaacac ccccccctg gtgaagctgt ggtaccagct 4920
ggagaaggag cccatcatcg gcgccgagac cttctacgtg gacggcgccg ccaaccgcga 4980
gaccaagctg ggcaaggccg gctacgtgac cgaccgcggc cgccagaagg tggtgcccct 5040
gaccgacacc accaaccaga agaccgagct gcaggccatc cacctggccc tgcaggacag 5100
cggcctggag gtgaacatcg tgaccgacag ccagtacgcc ctgggcatca tccaggccca 5160
gcccgacaag agcgagagcg agctggtgag ccagatcatc gagcagctga tcaagaagga 5220
gaaggtgtac ctggcctggg tgcccgccca caagggcatc ggcggcaacg agcaggtgga 5280
cggcctggtg agcgccggca tccgcaaggt gctgttcctg gacggcatcg acaaggccca 5340
ggaggagcac gagaagtacc acagcaactg gcgcgccatg gccagcgact tcaacctgcc 5400
ccccgtggtg gccaaggaga tcgtggccag ctgcgacaag tgccagctga agggcgaggc 5460
catgcacggc caggtggact gcagcccccgg catctggcag ctggactgca cccacctgga 5520
gggcaaggtg atcctggtgg ccgtgcacgt ggccagcggc tacatcgagg ccgaggtgat 5580
ccccgccgag accggccagg agaccgccta cttcctgctg aagctggccg gccgctggcc 5640
cgtgaagacc gtgcacaccg acaacggcag caacttcacc agcaccaccg tgaaggccgc 5700
ctgctggtgg gccggcatca agcaggagtt cggcatcccc tacaaccccc agagccaggg 5760
cgtgatcgag agcatgaaca aggagctgaa gaagatcatc ggccaggtgc gcgaccaggc 5820
cgagcacctg aagaccgccg tgcagatggc cgtgttcatc cacaacttca agcgcaaggg 5880
cggcatcggc ggctacagcg ccggcgagcg catcgtggac atcatcgcca ccgacatcca 5940
gaccaaggag ctgcagaagc agatcaccaa gatccagaac ttccgcgtgt actaccgcga 6000
cagccgcgac cccgtgtgga agggccccgc caagctgctg tggaagggcg agggcgccgt 6060
ggtgatccag gacaacagcg acatcaaggt ggtgccccgc cgcaaggcca agatcatccg 6120
cgactacggc aagcagatgg ccggcgacga ctgcgtggcc agccgccagg acgaggacta 6180
ggaattctgc tgtgccttct agttgccagc catctgttgt ttgcccctcc cccgtgcctt 6240

ccttgaccct ggaaggtgcc actcccactg tcctttccta ataaaatgag gaaattgcat 6300
cgcattgtct gagtaggtgt cattctattc tgggggggtgg ggtggggcag gacagcaagg 6360
gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct atgggtaccc 6420
aggtgctgaa gaattgaccc ggttcctcct gggccagaaa gaagcaggca catccccttc 6480
tctgtgacac accctgtcca cgcccctggt tcttagttcc agccccactc ataggacact 6540
catagctcag gagggctccg ccttcaatcc cacccgctaa agtacttgga gcggtctctc 6600
cctccctcat cagcccacca aaccaaacct agcctccaag agtgggaaga aattaaagca 6660
agataggcta ttaagtgcag agggagagaa aatgcctcca acatgtgagg aagtaatgag 6720
agaaatcata gaattttaag gccatcatgg ccttaatctt ccgcttcctc gctcactgac 6780
tcgctgcgct cggtcgttcg gctgcggcga gcggtatcag ctcactcaaa ggcggtaata 6840
cggttatcca cagaatcagg ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa 6900
aaggccagga accgtaaaaa ggccgcgttg ctggcgtttt tccataggct ccgccccct 6960
gacgagcatc acaaaaatcg acgctcaagt cagaggtggc gaaacccgac aggactataa 7020
agataccagg cgtttccccc tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg 7080
cttaccggat acctgtccgc ctttctccct tcgggaagcg tggcgctttc tcatagctca 7140
cgctgtaggt atctcagttc ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa 7200
ccccccgttc agcccgaccg ctgcgcctta tccggtaact atcgtcttga gtccaacccg 7260
gtaagacacg acttatcgcc actggcagca gccactggta acaggattag cagagcgagg 7320
tatgtaggcg gtgctacaga gttcttgaag tggtggccta actacggcta cactagaaga 7380
acagtatttg gtatctgcgc tctgctgaag ccagttacct tcggaaaaag agttggtagc 7440
tcttgatccg gcaaacaaac caccgctggt agcggtggtt tttttgtttg caagcagcag 7500
attacgcgca gaaaaaaagg atctcaagaa gatcctttga tcttttctac ggggtctgac 7560
gctcagtgga acgaaaactc acgttaaggg attttggtca tgagattatc aaaaaggatc 7620
ttcacctaga tccttttaaa ttaaaaatga agttttaaat caatctaaag tatatatgag 7680
taaacttggt ctgacagtta ccaatgctta atcagtgagg cacctatctc agcgatctgt 7740
ctatttcgtt catccatagt tgcctgactc ggggggggggg ggcgctgagg tctgcctcgt 7800
gaagaaggtg ttgctgactc ataccaggcc tgaatcgccc catcatccag ccagaaagtg 7860
agggagccac ggttgatgag agctttgttg taggtggacc agttggtgat tttgaacttt 7920
tgctttgcca cggaacggtc tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca 7980
gcaaaagttc gatttattca acaaagccgc cgtcccgtca agtcagcgta atgctctgcc 8040
agtgttacaa ccaattaacc aattctgatt agaaaaactc atcgagcatc aaatgaaact 8100
gcaatttatt catatcagga ttatcaatac catatttttg aaaaagccgt ttctgtaatg 8160
aaggagaaaa ctcaccgagg cagttccata ggatggcaag atcctggtat cggtctgcga 8220
ttccgactcg tccaacatca atacaaccta ttaatttccc ctcgtcaaaa ataaggttat 8280
caagtgagaa atcaccatga gtgacgactg aatccggtga gaatggcaaa agcttatgca 8340
tttctttcca gacttgttca acaggccagc cattacgctc gtcatcaaaa tcactcgcat 8400
caaccaaacc gttattcatt cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt 8460
taaaaggaca attacaaaca ggaatcgaat gcaaccggcg caggaacact gccagcgcat 8520
caacaatatt ttcacctgaa tcaggatatt cttctaatac ctggaatgct gttttcccgg 8580
ggatcgcagt ggtgagtaac catgcatcat caggagtacg gataaaatgc ttgatggtcg 8640
gaagaggcat aaattccgtc agccagttta gtctgaccat ctcatctgta acatcattgg 8700
caacgctacc tttgccatgt ttcagaaaca actctggcgc atcgggcttc ccatacaatc 8760
gatagattgt cgcacctgat tgcccgacat tatcgcgagc ccatttatac ccatataaat 8820
cagcatccat gttggaattt aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc 8880
tcataacacc ccttgtatta ctgtttatgt aagcagacag ttttattgtt catgatgata 8940
tatttttatc ttgtgcaatg taacatcaga gattttgaga cacaacgtgg ctttcccccc 9000
cccccattta ttgaagcatt tatcagggtt attgtctcat gagcggatac atatttgaat 9060
gtatttagaa aaataaacaa atagggggttc cgcgcacatt tccccgaaaa gtgccacctg 9120
acgtctaaga aaccattatt atcatgacat taacctataa aaataggcgt atcacgaggc 9180
cctttcgtc 9189

<210> 160
<211> 9285

<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing SIV genes

<400> 160
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgacg ccgccaccat gggcgtgcgc aacagcgtgc tgagcggcaa 1920
gaaggccgac gagctggaga agatccgcct gcgcccgaac ggcaagaaga agtacatgct 1980
gaagcacgtg gtgtgggccg ccaacgagct ggaccgcttc ggcctggccg agagcctgct 2040
ggagaacaag gagggctgcc agaagatcct gagcgtgctg gcgccgctgg tgcccaccgg 2100
cagcgagaac ctgaagagcc tgtacaacac cgtgtgcgtg atctggtgca tccacgccga 2160
ggagaaggtg aagcacaccg aggaggccaa gcagatcgtg cagcgccacc tggtggtgga 2220
gaccggcacc accgagacca tgcccaagac cagccgcccg accgcgccca gcagcggacg 2280
cggcggcaac tacccggtgc agcagatcgg cggcaactac gtgcacctgc cgctgagccc 2340
gcgcaccctg aacgcctggg tgaagctgat cgaggagaag aagttcggcg ccgaggtggt 2400
gcccggcttc caggccctga gcgagggctg cacgccctac gacatcaacc agatgctgaa 2460
ctgcgtgggc gaccaccagg ccgccatgca gatcatccgc gacatcatca acgaggaggc 2520
cgccgactgg gacctgcagc acccgcagcc cgcgccgcag cagggccagc tgcgcgagcc 2580
cagcggcagc gacatcgccg gcaccaccag cagcgtggac gagcagatcc agtggatgta 2640
ccgccagcag aacccgatcc cggtgggcaa catctaccgc cgctggatac agctgggcct 2700
gcagaagtgc gtgcgcatgt acaacccgac caacatcctg gacgtgaagc agggcccgaa 2760
ggagcccttc cagagctacg tggaccgctt ctacaagagc ctgcgcgccg agcagaccga 2820
cgccgccgtg aagaactgga tgacccagac cctgctgatc cagaacgcca acccggactg 2880

caagctggtg ctgaagggcc tgggcgtgaa cccgaccctg gaggagatgc tgaccgcctg 2940
ccagggcgtg ggcggcccgg gccagaaggc ccgcctgatg gccgaggccc tgaaggaggc 3000
cctggcgccc gtgcccatcc cgttcgcggc cgcccagcag cgcggcccgc gcaagcccat 3060
caagtgctgg aactgcggca aggagggcca cagcgcccgc cagtgccgcg cgccgcgccg 3120
ccagggctgc tggaagtgcg gcaagatgga ccacgtgatg gccaagtgcc cggaccgcca 3180
ggcgggtttt ttaggccttg gtccatgggg aaagaagccg cgcaatttcc cgatggctca 3240
agtgcatcag gggctgatgc caactgctcc gccagaggac ccagctgtgg atctgctaaa 3300
gaactacatg cagttgggca agcagcagag agaaaagcag agagaaagca gagagaagcc 3360
ttacaaggag gtgacagagg atttgctgca cctcaattct ctctttggag gagaccagta 3420
gtcactgcat cgatcgaggg ccagcccgtg gaggtgcttc tagacaccgg cgccgacgac 3480
agcatcgtga ccggcatcga gctgggcccg cactacaccc cgaagatcgt gggcggcatc 3540
ggcggcttca tcaacaccgg agagtacaag aacgtggaga tcgaggtgct gggcaagcgc 3600
atcaagggca ccatcatgac cggcgacacg cccatcaaca tcttcggccg caacctgctg 3660
accgccctgg gcatgagcct gaacttcccc atcgccaagg tggagcccgt gaaggtggcc 3720
ctgaagcccg gcaaggacgg ccccaagctg aagcagtggc ccctgagcaa ggagaagatc 3780
gtggccctgc gcgagatctg cgagaagatg gagaaggacg gccagctgga ggaggcccca 3840
cccaccaacc cctacaacac gcccaccttc gccatcaaga agaaggacaa gaacaagtgg 3900
cgcatgctga tcgacttccg cgagctgaac cgcgtgaccc aggacttcac cgaggtgcag 3960
ctgggcatcc cgcaccccgc cggcctggcc aagcgcaagc gcatcaccgt gctggacatc 4020
ggcgacgcct acttcagcat ccccctggac gaggagttcc gccagtacac cgccttcacc 4080
ctgcccagcg tgaacaacgc cgagcccggc aagcgctaca tctacaaggt gctgccccag 4140
ggctggaagg gcagccccgc catcttccag tacaccatgc gccacgtgct ggagcccttc 4200
cgcaaggcca accccgacgt gaccctggtg cagtacatgc atgacatcct gatcgccagc 4260
gaccgcaccg acctggagca cgaccgcgtg gtgctgcaga gcaaggagct gctgaacagc 4320
atcggcttca gcacgcccga ggagaagttc cagaaggacc cacccttcca gtggatgggc 4380
tacgagctgt ggcccaccaa gtggaagctg cagaagatcg agctgcccca gcgcgagacc 4440
tggaccgtga acgacatcca gaagctggtg ggcgtgctga actgggccgc ccagatctac 4500
cccggcatca agaccaagca cctgtgccgc ctgatccgcg gcaagatgac cctgaccgag 4560
gaggtgcagt ggaccgagat ggccgaggcc gagtacgagg agaacaagat catcctgagc 4620
caggagcagg agggctgcta ctaccaggag ggcaagcccc tggaggccac cgtgatcaag 4680
agccaggaca accagtggag ctacaagatc caccaggagg acaagatcct gaaggtgggc 4740
aagttcgcca agatcaagaa cacccacacc aacggcgtgc gcctgctggc ccacgtgatc 4800
cagaagatcg gcaaggaggc catcgtgatc tggggccagg tgcccaagtt ccacctgccc 4860
gtggagaagg acgtgtggga gcagtggtgg accgactact ggcaggtgac ctggataccc 4920
gagtgggact tcatcagcac ccctcccctg gtgcgcctgg tgttcaacct ggtgaaggac 4980
cccatcgagg gcgaggagac ctactacacc gacggcagct gcaacaagca gagcaaggag 5040
ggcaaggccg gctacatcac cgaccgcggc aaggacaagg tgaaggtgct ggagcagacc 5100
accaaccagc aggccgagct cgaggccttc ctgatggccc tgaccgacag cggccccaag 5160
gccaacatca tcgtggacag ccagtacgtg atgggcatca tcaccggctg ccccaccgag 5220
agcgagagcc gcctggtgaa ccagatcatc gaggagatga tcaagaagag cgagatctac 5280
gtggcctggg tgcccgccca caagggcatc ggcggcaacc aggagatcga ccacctggtg 5340
agccagggca tccgccaggt gctgttcctg gagaagatcg agcccgccca ggaggagcac 5400
gacaagtacc acagcaacgt gaaggagctg gtgttcaagt tcggcctgcc ccgcatcgtg 5460
gcccgccaga tcgtggacac ctgcgacaag tgccaccaga agggcgaggc catccacggc 5520
caggccaaca gcgacctggg cacctggcag atggcctgca cccacctgga gggcaagatc 5580
atcatcgtgg ccgtgcacgt ggccagcggc ttcatcgagg ccgaggtgat cccgcaggag 5640
accggccgcc agaccgccct gttcctgctg aagctggccg gccgctggcc catcacccac 5700
ctgcacaccg acaacggcgc caacttcgcc agccaggagg tgaagatggt ggcctggtgg 5760
gccggcatcg agcacacctt cggcgtgccc tacaacccgc agagccaggg cgtggtggag 5820
gccatgaacc accacctgaa gaaccagatc gaccgcatcc gcgagcaggc caacagcgtg 5880
gagaccatcg tgctgatggc cgtgcactgc atgaacttca agcgccgcgg cggcatcggc 5940
gacatgacgc ccgccgagcg cctgatcaac atgatcacca ccgagcagga gatccagttc 6000
cagcagagca agaacagcaa gttcaagaac ttccgcgtgt actaccgcga gggccgcgac 6060
cagctgtgga agggccccgg cgagctgctg tggaagggcg agggcgccgt gatcctgaag 6120
gtgggcaccg acatcaaggt ggtgccccgc cgcaaggcca agatcatcaa ggactacggc 6180

ggcggcaagg aggtggacag cagcagccac atggaggaca ccggcgaggc ccgcgaggtg 6240
gcctgagaat tcgtttaaac acgcgtgtat acggatccag atctgctgtg ccttctagtt 6300
gccagccatc tgttgtttgc ccctcccccg tgccttcctt gaccctggaa ggtgccactc 6360
ccactgtcct ttcctaataa aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt 6420
ctattctggg gggtggggtg gggcaggaca gcaaggggga ggattgggaa gacaatagca 6480
ggcatgctgg ggatgcggtg ggctctatgg gtacccaggt gctgaagaat tgacccggtt 6540
cctcctgggc cagaaagaag caggcacatc cccttctctg tgacacaccc tgtccacgcc 6600
cctggttctt agttccagcc ccactcatag gacactcata gctcaggagg gctccgcctt 6660
caatcccacc cgctaaagta cttggagcgg tctctccctc cctcatcagc ccaccaaacc 6720
aaacctagcc tccaagagtg ggaagaaatt aaagcaagat aggctattaa gtgcagaggg 6780
agagaaaatg cctccaacat gtgaggaagt aatgagagaa atcatagaat tttaaggcca 6840
tcatggcctt aatcttccgc ttcctcgctc actgactcgc tgcgctcggt cgttcggctg 6900
cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt tatccacaga atcaggggat 6960
aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc 7020
gcgttgctgg cgtttttcca taggctccgc ccccctgacg agcatcacaa aaatcgacgc 7080
tcaagtcaga ggtggcgaaa cccgacagga ctataaagat accaggcgtt tccccctgga 7140
agctccctcg tgcgctctcc tgttccgacc ctgccgctta ccggatacct gtccgccttt 7200
ctcccttcgg gaagcgtggc gctttctcat agctcacgct gtaggtatct cagttcggtg 7260
taggtcgttc gctccaagct gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc 7320
gccttatccg gtaactatcg tcttgagtcc aacccggtaa gacacgactt atcgccactg 7380
gcagcagcca ctggtaacag gattagcaga gcgaggtatg taggcggtgc tacagagttc 7440
ttgaagtggt ggcctaacta cggctacact agaagaacag tatttggtat ctgcgctctg 7500
ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa acaaaccacc 7560
gctggtagcg gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct 7620
caagaagatc ctttgatctt ttctacgggg tctgacgctc agtggaacga aaactcacgt 7680
taagggattt tggtcatgag attatcaaaa aggatcttca cctagatcct tttaaattaa 7740
aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa cttggtctga cagttaccaa 7800
tgcttaatca gtgaggcacc tatctcagcg atctgtctat ttcgttcatc catagttgcc 7860
tgactcgggg gggggggcg ctgaggtctg cctcgtgaag aaggtgttgc tgactcatac 7920
caggcctgaa tcgccccatc atccagccag aaagtgaggg agccacggtt gatgagagct 7980
ttgttgtagg tggaccagtt ggtgattttg aacttttgct ttgccacgga acggtctgcg 8040
ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa aagttcgatt tattcaacaa 8100
agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg ttacaaccaa ttaaccaatt 8160
ctgattagaa aaactcatcg agcatcaaat gaaactgcaa tttattcata tcaggattat 8220
caataccata tttttgaaaa agccgtttct gtaatgaagg agaaaactca ccgaggcagt 8280
tccataggat ggcaagatcc tggtatcggt ctgcgattcc gactcgtcca acatcaatac 8340
aacctattaa tttccccctcg tcaaaaataa ggttatcaag tgagaaatca ccatgagtga 8400
cgactgaatc cggtgagaat ggcaaaagct tatgcatttc tttccagact tgttcaacag 8460
gccagccatt acgctcgtca tcaaaatcac tcgcatcaac caaaccgtta ttcattcgtg 8520
attgcgcctg agcgagacga aatacgcgat cgctgttaaa aggacaatta caaacaggaa 8580
tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac aatattttca cctgaatcag 8640
gatattcttc taatacctgg aatgctgttt tcccggggat cgcagtggtg agtaaccatg 8700
catcatcagg agtacggata aaatgcttga tggtcggaag aggcataaat tccgtcagcc 8760
agtttagtct gaccatctca tctgtaacat cattggcaac gctacctttg ccatgtttca 8820
gaaacaactc tggcgcatcg ggcttcccat acaatcgata gattgtcgca cctgattgcc 8880
cgacattatc gcgagcccat ttatacccat ataaatcagc atccatgttg gaatttaatc 8940
gcggcctcga gcaagacgtt tcccgttgaa tatggctcat aacacccctt gtattactgt 9000
ttatgtaagc agacagtttt attgttcatg atgatatatt tttatcttgt gcaatgtaac 9060
atcagagatt ttgagacaca acgtggcttt cccccccccc ccattattga agcatttatc 9120
agggttattg tctcatgagc ggatacatat ttgaatgtat ttagaaaaat aaacaaatag 9180
gggttccgcg cacatttccc cgaaaagtgc cacctgacgt ctaagaaacc attattatca 9240
tgacattaac ctataaaaat aggcgtatca cgaggccctt tcgtc 9285

<210> 161
<211> 7897
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 161
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgagggaaga tctggccttc ccacaaggga aggccaggga 1920
attttcttca gagcagacca gagccaacag ccccaccaga agagagcttc aggtttgggg 1980
aagagacaac aactccctct cagaagcagg agccgataga caaggaactg tatcctttag 2040
cttccctcag atcactcttt ggcagcgacc cctcgtcaca ataaagatag ggggccagct 2100
gaaggaggcc cttctagaca ccggcgccga cgacaccgtg ctggaggaga tgaacctgcc 2160
cggccgctgg aagcccaaga tgatcggcgg catcggcggc ttcatcaagg tgggccagta 2220
cgaccagatc ctgatcgaga tctgcggcca caaggccatc ggcaccgtgc tggtgggccc 2280
caccccgtg aacatcatcg gccgcaacct gctgacccag atcggctgca ccctgaactt 2340
ccccatcagc cccatcgaga ccgtgcccgt gaagctgaag cccggcatgg acggccccaa 2400
ggtgaagcag tggcccctga ccgaggagaa gatcaaggcc ctggtggaga tctgcaccga 2460
gatggagaag gagggcaaga tcagcaagat cggccccgag aaccctaca acaccccgt 2520
gttcgccatc aagaagaagg acagcaccaa gtggcgcaag ctggtggact tccgcgagct 2580
gaacaagcgc acccaggact tctgggaggt gcagctgggc atccccacc ccgccggcct 2640
gaagcagaag aagagcgtga ccgtgctgga cgtgggcgac gcctacttca gcgtgccct 2700
ggacaaggac ttccgcaagt acaccgcctt caccatcccc agcatcaaca acgagacccc 2760

cggcatccgc taccagtaca acgtgctgcc ccagggctgg aagggcagcc ccgccatctt 2820
ccagtgcagc atgaccaaga tcctggagcc cttccgcaag cagaaccccg acatcgtgat 2880
ctaccagtac atggacgacc tgtacgtggg cagcgacctg gagatcggcc agcaccgcac 2940
caagatcgag gagctgcgcc agcacctgct gcgctggggc ttcaccaccc ccgacaagaa 3000
gcaccagaag gagcccccct tcctgtggat gggctacgag ctgcaccccg acaagtggac 3060
cgtgcagccc atcgtgctgc ccgagaagga cagctggacc gtgaacgaca tccagaagct 3120
ggtgggcaag ctgaactggg ccagccagat ctacgccggc atcaaggtgc gccagctgtg 3180
caagctgctg cgcggcacca aggccctgac cgaggtggtg cccctgaccg aggaggccga 3240
gctggagctg gccgagaacc gcgagatcct gaaggagccc gtgcacggcg tgtactacga 3300
ccccagcaag gacctgatcg ccgagatcca gaagcagggc cagggccagt ggacctacca 3360
gatctaccag gagcccttca agaacctgaa gaccggcaag tacgcccgca tgaagggcgc 3420
ccacaccaac gacgtgaagc agctgaccga ggccgtgcag aagatcgcca ccgagagcat 3480
cgtgatctgg ggcaagaccc ccaagttcaa gctgcccatc cagaaggaga cctgggaggc 3540
ctggtggacc gagtactggc aggccacctg gatccccgag tgggagttcg tgaacacccc 3600
ccccctggtg aagctgtggt accagctgga gaaggagccc atcatcggcg ccgagacctt 3660
ctacgtggac ggcgccgcca accgcgagac caagctgggc aaggccggct acgtgaccga 3720
ccgcggccgc cagaaggtgg tgcccctgac cgacaccacc aaccagaaga ccgagctgca 3780
ggccatccac ctggccctgc aggacagcgg cctggaggtg aacatcgtga ccgacagcca 3840
gtacgccctg ggcatcatcc aggcccagcc cgacaagagc gagagcgagc tggtgagcca 3900
gatcatcgag cagctgatca agaaggagaa ggtgtacctg gcctgggtgc ccgcccacaa 3960
gggcatcggc ggcaacgagc aggtggacgg cctggtgagc gccggcatcc gcaaggtgct 4020
gttcctggac ggcatcgaca aggcccagga ggagcacgag aagtaccaca gcaactggcg 4080
cgccatggcc agcgacttca acctgccccc cgtggtggcc aaggagatcg tggccagctg 4140
cgacaagtgc cagctgaagg gcgaggccat gcacggccag gtggactgca gccccggcat 4200
ctggcagctg gactgcaccc acctggaggg caaggtgatc ctggtggccg tgcacgtggc 4260
cagcggctac atcgaggccg aggtgatccc cgccgagacc ggccaggaga ccgcctactt 4320
cctgctgaag ctggccggcc gctggcccgt gaagaccgtg cacaccgaca acggcagcaa 4380
cttcaccagc accaccgtga aggccgcctg ctggtgggcc ggcatcaagc aggagttcgg 4440
catcccctac aaccccaga gccagggcgt gatcgagagc atgaacaagg agctgaagaa 4500
gatcatcggc caggtgcgcg accaggccga gcacctgaag accgccgtgc agatggccgt 4560
gttcatccac aacttcaagc gcaagggcgg catcggcggc tacagcgccg gcgagcgcat 4620
cgtggacatc atcgccaccg acatccagac caaggagctg cagaagcaga tcaccaagat 4680
ccagaacttc cgcgtgtact accgcgacag ccgcgacccc gtgtggaagg gccccgccaa 4740
gctgctgtgg aagggcgagg gcgccgtggt gatccaggac aacagcgaca tcaaggtggt 4800
gccccgccgc aaggccaaga tcatccgcga ctacggcaag cagatggccg gcgacgactg 4860
cgtggccagc cgccaggacg aggactagga atttctgctg tgccttctag ttgccagcca 4920
tctgttgttt gcccctcccc cgtgccttcc ttgaccctgg aaggtgccac tcccactgtc 4980
ctttcctaat aaaatgagga aattgcatcg cattgtctga gtaggtgtca ttctattctg 5040
gggggtgggg tggggcagga cagcaagggg gaggattggg aagacaatag caggcatgct 5100
ggggatgcgg tgggctctat gggtacccag gtgctgaaga attgacccgg ttcctcctgg 5160
gccagaaaga agcaggcaca tccccttctc tgtgacacac cctgtccacg cccctggttc 5220
ttagttccag ccccactcat aggacactca tagctcagga gggctccgcc ttcaatccca 5280
cccgctaaag tacttggagc ggtctctccc tccctcatca gcccaccaaa ccaaacctag 5340
cctccaagag tgggaagaaa ttaaagcaag ataggctatt aagtgcagag ggagagaaaa 5400
tgcctccaac atgtgaggaa gtaatgagag aaatcataga attttaaggc catcatggcc 5460
ttaatcttcc gcttcctcgc tcactgactc gctgcgctcg gtcgttcggc tgcggcgagc 5520
ggtatcagct cactcaaagg cggtaatacg gttatccaca gaatcagggg ataacgcagg 5580
aaagaacatg tgagcaaaag gccagcaaaa ggccaggaac cgtaaaaagg ccgcgttgct 5640
ggcgtttttc cataggctcc gccccccctga cgagcatcac aaaaatcgac gctcaagtca 5700
gaggtggcga aacccgacag gactataaag ataccaggcg tttccccctg gaagctccct 5760
cgtgcgctct cctgttccga ccctgccgct taccggatac ctgtccgcct ttctcccttc 5820
gggaagcgtg gcgctttctc atagctcacg ctgtaggtat ctcagttcgg tgtaggtcgt 5880
tcgctccaag ctgggctgtg tgcacgaacc ccccgttcag cccgaccgct gcgccttatc 5940
cggtaactat cgtcttgagt ccaacccggt aagacacgac ttatcgccac tggcagcagc 6000
cactggtaac aggattagca gagcgaggta tgtaggcggt gctacagagt tcttgaagtg 6060

gtggcctaac tacggctaca ctagaagaac agtatttggt atctgcgctc tgctgaagcc 6120
agttaccttc ggaaaaagag ttggtagctc ttgatccggc aaacaaacca ccgctggtag 6180
cggtggtttt tttgtttgca agcagcagat tacgcgcaga aaaaaaggat ctcaagaaga 6240
tcctttgatc ttttctacgg ggtctgacgc tcagtggaac gaaaactcac gttaagggat 6300
tttggtcatg agattatcaa aaaggatctt cacctagatc cttttaaatt aaaaatgaag 6360
ttttaaatca atctaaagta tatatgagta aacttggtct gacagttacc aatgcttaat 6420
cagtgaggca cctatctcag cgatctgtct atttcgttca tccatagttg cctgactcgg 6480
gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat accaggcctg 6540
aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag ctttgttgta 6600
ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg cgttgtcggg 6660
aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac aaagccgccg 6720
tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa ttctgattag 6780
aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt atcaatacca 6840
tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca gttccatagg 6900
atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat acaacctatt 6960
aatttccccc cgtcaaaaat aaggttatca agtgagaaat caccatgagt gacgactgaa 7020
tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac aggccagcca 7080
ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg tgattgcgcc 7140
tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg aatcgaatgc 7200
aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc aggatattct 7260
tctaatacct ggaatgctgt tttcccgggg atcgcagtgg tgagtaacca tgcatcatca 7320
ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag ccagtttagt 7380
ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt cagaaacaac 7440
tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg cccgacatta 7500
tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa tcgcggcctc 7560
gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact gtttatgtaa 7620
gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta acatcagaga 7680
ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta tcagggttat 7740
tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat aggggttccg 7800
cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat catgacatta 7860
acctataaaa ataggcgtat cacgaggccc tttcgtc 7897

<210> 162
<211> 7984
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing SIV genes

<400> 162
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720

catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgacg ccgccaccat gaggccttgg tccatgggga aagaagcccc 1920
gcaatttccc catggctcaa gtgcatcagg ggctgatgcc aactgctccc cgagaggacc 1980
cagctgtgga tctgctaaag aactacatgc agttgggcaa gcagcagaga gaaaagcaga 2040
gagaaagcag agagaagcct tacaaggagg tgacagagga tttgctgcac ctcaattctc 2100
tctttggagg agaccagtag tcactgcatc gatcgagggc cagcccgtgg aggtgcttct 2160
agacaccggc gccgacgaca gcatcgtgac cggcatcgag ctgggcccgc actacacccc 2220
gaagatcgtg ggcggcatcg gcggcttcat caacaccgga gagtacaaga acgtggagat 2280
cgaggtgctg ggcaagcgca tcaagggcac catcatgacc ggcgacacgc ccatcaacat 2340
cttcggccgc aacctgctga ccgccctggg catgagcctg aacttcccca tcgccaaggt 2400
ggagcccgtg aaggtggccc tgaagcccgg caaggacggc cccaagctga agcagtggcc 2460
cctgagcaag gagaagatcg tggccctgcg cgagatctgc gagaagatgg agaaggacgg 2520
ccagctggag gaggccccac ccaccaaccc ctacaacacg cccaccttcg ccatcaagaa 2580
gaaggacaag aacaagtggc gcatgctgat cgacttccgc gagctgaacc gcgtgaccca 2640
ggacttcacc gaggtgcagc tgggcatccc gcaccccgcc ggcctggcca agcgcaagcg 2700
catcaccgtg ctggacatcg gcgacgccta cttcagcatc cccctggacg aggagttccg 2760
ccagtacacc gccttcaccc tgcccagcgt gaacaacgcc gagcccggca agcgctacat 2820
ctacaaggtg ctgccccagg gctggaaggg cagccccgcc atcttccagt acaccatgcg 2880
ccacgtgctg gagcccttcc gcaaggccaa ccccgacgtg accctggtgc agtacatgca 2940
tgacatcctg atcgccagcg accgcaccga cctggagcac gaccgcgtgg tgctgcagag 3000
caaggagctg ctgaacagca tcggcttcag cacgcccgag gagaagttcc agaaggaccc 3060
accttccag tggatgggct acgagctgtg gcccaccaag tggaagctgc agaagatcga 3120
gctgccccag cgcgagacct ggaccgtgaa cgacatccag aagctggtgg gcgtgctgaa 3180
ctgggccgcc cagatctacc ccggcatcaa gaccaagcac ctgtgccgcc tgatccgcgg 3240
caagatgacc ctgaccgagg aggtgcagtg gaccgagatg gccgaggccg agtacgagga 3300
gaacaagatc atcctgagcc aggagcagga gggctgctac taccaggagg gcaagccccc 3360
ggaggccacc gtgatcaaga gccaggacaa ccagtggagc tacaagatcc accaggagga 3420
caagatcctg aaggtgggca agttcgccaa gatcaagaac acccacacca acggcgtgcg 3480
cctgctggcc cacgtgatcc agaagatcgg caaggaggcc atcgtgatct ggggccaggt 3540
gcccaagttc cacctgcccg tggagaagga cgtgtgggag cagtggtgga ccgactactg 3600
gcaggtgacc tggatacccg agtgggactt catcagcacc cctcccctgg tgcgcctggt 3660
gttcaacctg gtgaaggacc ccatcgaggg cgaggagacc tactacaccg acggcagctg 3720
caacaagcag agcaaggagg gcaaggccgg ctacatcacc gaccgcggca aggacaaggt 3780
gaaggtgctg gagcagacca ccaaccagca ggccgagctc gaggccttcc tgatggccct 3840
gaccgacagc ggccccaagg ccaacatcat cgtggacagc cagtacgtga tgggcatcat 3900
caccggctgc cccaccgaga gcgagagccg cctggtgaac cagatcatcg aggagatgat 3960
caagaagagc gagatctacg tggcctgggt gcccgcccac aagggcatcg gcggcaacca 4020

ggagatcgac cacctggtga gccagggcat ccgccaggtg ctgttcctgg agaagatcga 4080
gcccgcccag gaggagcacg acaagtacca cagcaacgtg aaggagctgg tgttcaagtt 4140
cggcctgccc cgcatcgtgg cccgccagat cgtggacacc tgcgacaagt gccaccagaa 4200
gggcgaggcc atccacggcc aggccaacag cgacctgggc acctggcaga tggcctgcac 4260
ccacctggag ggcaagatca tcatcgtggc cgtgcacgtg gccagcggct tcatcgaggc 4320
cgaggtgatc ccgcaggaga ccggccgcca gaccgccctg ttcctgctga agctggccgg 4380
ccgctggccc atcacccacc tgcacaccga caacggcgcc aacttcgcca gccaggaggt 4440
gaagatggtg gcctggtggg ccggcatcga gcacaccttc ggcgtgccct acaacccgca 4500
gagccagggc gtggtggagg ccatgaacca ccacctgaag aaccagatcg accgcatccg 4560
cgagcaggcc aacagcgtgg agaccatcgt gctgatggcc gtgcactgca tgaacttcaa 4620
gcgccgcggc ggcatcggcg acatgacgcc cgccgagcgc ctgatcaaca tgatcaccac 4680
cgagcaggag atccagttcc agcagagcaa gaacagcaag ttcaagaact tccgcgtgta 4740
ctaccgcgag ggccgcgacc agctgtggaa gggccccggc gagctgctgt ggaagggcga 4800
gggcgccgtg atcctgaagg tgggcaccga catcaaggtg gtgccccgcc gcaaggccaa 4860
gatcatcaag gactacggcg gcggcaagga ggtggacagc agcagccaca tggaggacac 4920
cggcgaggcc cgcgaggtgg cctgagaatt cgtttaaaca cgcgtgtata cggatccaga 4980
tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctcccccgt gccttccttg 5040
accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat tgcatcgcat 5100
tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag caagggggag 5160
gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg tacccaggtg 5220
ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc ccttctctgt 5280
gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg acactcatag 5340
ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt ctctccctcc 5400
ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta aagcaagata 5460
ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta atgagagaaa 5520
tcatagaatt ttaaggccat catggcctta atcttccgct tcctcgctca ctgactcgct 5580
gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg taatacggtt 5640
atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc 5700
caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc cccctgacga 5760
gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac tataaagata 5820
ccaggcgttt cccccctggaa gctccctcgt gcgctctcct gttccgaccc tgccgcttac 5880
cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata gctcacgctg 5940
taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc 6000
cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca acccggtaag 6060
acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag cgaggtatgt 6120
aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta gaagaacagt 6180
atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg gtagctcttg 6240
atccggcaaa caaaccaccg ctggtagcgg tggttttttt gtttgcaagc agcagattac 6300
gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt ctgacgctca 6360
gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac 6420
ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat atgagtaaac 6480
ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga tctgtctatt 6540
tcgttcatcc atagttgcct gactcggggg gggggggcgc tgaggtctgc ctcgtgaaga 6600
aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga aagtgaggga 6660
gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga acttttgctt 6720
tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca actcagcaaa 6780
agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct ctgccagtgt 6840
tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg aaactgcaat 6900
ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg taatgaagga 6960
gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc tgcgattccg 7020
actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag gttatcaagt 7080
gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt atgcatttct 7140
ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact cgcatcaacc 7200
aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc gctgttaaaa 7260
ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag cgcatcaaca 7320

atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt cccggggatc 7380
gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat ggtcggaaga 7440
ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc attggcaacg 7500
ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata caatcgatag 7560
attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata taaatcagca 7620
tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat atggctcata 7680
acacccctg tattactgtt tatgtaagca gacagtttta ttgttcatga tgatatattt 7740
ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc ccccccccc 7800
cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt tgaatgtatt 7860
tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc acctgacgtc 7920
taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac gaggcccttt 7980
cgtc 7984

<210> 163
<211> 9194
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 163
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860

tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgccccgg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaatttttt 3180
agggaagatc tggccttccc acaagggaag gccagggaat tttcttcaga gcagaccaga 3240
gccaacagcc ccaccagaag agagcttcag gtttggggaa gagacaacaa ctccctctca 3300
gaagcaggag ccgatagaca aggaactgta tcctttagct tccctcagat cactctttgg 3360
cagcgacccc tcgtcacaat aaagataggg ggccagctga aggaggccct tctagacacc 3420
ggcgccgacg acaccgtgct ggaggagatg aacctgcccg gccgctggaa gcccaagatg 3480
atcggcggca tcggcggctt catcaaggtg ggccagtacg accagatcct gatcgagatc 3540
tgcggccaca aggccatcgg caccgtgctg gtgggcccca cccccgtgaa catcatcggc 3600
cgcaacctgc tgacccagat cggctgcacc ctgaacttcc ccatcagccc catcgagacc 3660
gtgcccgtga agctgaagcc cggcatggac ggccccaagg tgaagcagtg gcccctgacc 3720
gaggagaaga tcaaggccct ggtggagatc tgcaccgaga tggagaagga gggcaagatc 3780
agcaagatcg gccccgagaa ccctacaac accccccgtgt tcgccatcaa gaagaaggac 3840
agcaccaagt ggcgcaagct ggtggacttc cgcgagctga acaagcgcac ccaggacttc 3900
tgggaggtgc agctgggcat cccccacccc gccggcctga agcagaagaa gagcgtgacc 3960
gtgctggacg tgggcgacgc ctacttcagc gtgccctgg acaaggactt ccgcaagtac 4020
accgccttca ccatccccag catcaacaac gagacccccg gcatccgcta ccagtacaac 4080
gtgctgcccc agggctggaa gggcagcccc gccatcttcc agtgcagcat gaccaagatc 4140
ctggagccct tccgcaagca gaaccccgac atcgtgatct accagtacat ggacgacctg 4200
tacgtgggca gcgacctgga gatcggccag caccgcacca agatcgagga gctgcgccag 4260
cacctgctgc gctggggctt caccaccccc gacaagaagc accagaagga gccccccttc 4320
ctgtggatgg gctacgagct gcaccccgac aagtggaccg tgcagcccat cgtgctgccc 4380
gagaaggaca gctggaccgt gaacgacatc cagaagctgg tgggcaagct gaactgggcc 4440
agccagatct acgccggcat caaggtgcgc cagctgtgca agctgctgcg cggcaccaag 4500
gccctgaccg aggtggtgcc cctgaccgag gaggccgagc tggagctggc cgagaaccgc 4560
gagatcctga aggagcccgt gcacggcgtg tactacgacc ccagcaagga cctgatcgcc 4620
gagatccaga agcagggcca gggccagtgg acctaccaga tctaccagga gcccttcaag 4680
aacctgaaga ccggcaagta cgcccgcatg aagggcgccc acaccaacga cgtgaagcag 4740
ctgaccgagg ccgtgcagaa gatcgccacc gagagcatcg tgatctgggg caagaccccc 4800
aagttcaagc tgcccatcca gaaggagacc tgggaggcct ggtggaccga gtactggcag 4860
gccacctgga tccccgagtg ggagttcgtg aacaccccca ccctggtgaa gctgtggtac 4920
cagctggaga aggagcccat catcggcgcc gagaccttct acgtggacgg cgccgccaac 4980
cgcgagacca agctgggcaa ggccggctac gtgaccgacc gcggccgcca gaaggtggtg 5040
cccctgaccg acaccaccaa ccagaagacc gagctgcagg ccatccacct ggccctgcag 5100
gacagcggcc tggaggtgaa catcgtgacc gacagccagt acgccctggg catcatccag 5160

gcccagcccg acaagagcga gagcgagctg gtgagccaga tcatcgagca gctgatcaag 5220
aaggagaagg tgtacctggc ctgggtgccc gcccacaagg gcatcggcgg caacgagcag 5280
gtggacggcc tggtgagcgc cggcatccgc aaggtgctgt tcctggacgg catcgacaag 5340
gcccaggagg agcacgagaa gtaccacagc aactggcgcg ccatggccag cgacttcaac 5400
ctgccccccg tggtggccaa ggagatcgtg gccagctgcg acaagtgcca gctgaagggc 5460
gaggccatgc acggccaggt ggactgcagc cccggcatct ggcagctgga ctgcacccac 5520
ctggagggca aggtgatcct ggtggccgtg cacgtggcca gcggctacat cgaggccgag 5580
gtgatccccg ccgagaccgg ccaggagacc gcctacttcc tgctgaagct ggccggccgc 5640
tggcccgtga agaccgtgca caccgacaac ggcagcaact tcaccagcac caccgtgaag 5700
gccgcctgct ggtgggccgg catcaagcag gagttcggca tcccctacaa cccccagagc 5760
cagggcgtga tcgagagcat gaacaaggag ctgaagaaga tcatcggcca ggtgcgcgac 5820
caggccgagc acctgaagac cgccgtgcag atggccgtgt tcatccacaa cttcaagcgc 5880
aagggcggca tcggcggcta cagcgccggc gagcgcatcg tggacatcat cgccaccgac 5940
atccagacca aggagctgca gaagcagatc accaagatcc agaacttccg cgtgtactac 6000
cgcgacagcc gcgaccccgt gtggaagggc cccgccaagc tgctgtggaa gggcgagggc 6060
gccgtggtga tccaggacaa cagcgacatc aaggtggtgc cccgccgcaa ggccaagatc 6120
atccgcgact acggcaagca gatggccggc gacgactgcg tggccagccg ccaggacgag 6180
gactaggaat tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctcccccgt 6240
gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat 6300
tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag 6360
caagggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg 6420
tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc 6480
ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg 6540
acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt 6600
ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta 6660
aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta 6720
atgagagaaa tcatagaatt ttaaggccat catggcctta atcttccgct tcctcgctca 6780
ctgactcgct gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg 6840
taatacggtt atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc 6900
agcaaaaggc caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc 6960
cccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 7020
tataaagata ccaggcgttt ccccctggaa gctccctcgt gcgctctcct gttccgaccc 7080
tgccgcttac cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata 7140
gctcacgctg taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc 7200
acgaaccccc cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca 7260
acccggtaag acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag 7320
cgaggtatgt aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta 7380
gaagaacagt atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg 7440
gtagctcttg atccggcaaa caaaccaccg ctggtagcgg tggttttttt gtttgcaagc 7500
agcagattac gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt 7560
ctgacgctca gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa 7620
ggatcttcac ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat 7680
atgagtaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga 7740
tctgtctatt tcgttcatcc atagttgcct gactcggggg gggggggcgc tgaggtctgc 7800
ctcgtgaaga aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga 7860
aagtgaggga gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga 7920
acttttgctt tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca 7980
actcagcaaa agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct 8040
ctgccagtgt tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg 8100
aaactgcaat ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg 8160
taatgaagga gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc 8220
tgcgattccg actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag 8280
gttatcaagt gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt 8340
atgcatttct ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact 8400
cgcatcaacc aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc 8460

gctgttaaaa ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag 8520
cgcatcaaca atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt 8580
cccggggatc gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat 8640
ggtcggaaga ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc 8700
attggcaacg ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata 8760
caatcgatag attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata 8820
taaatcagca tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat 8880
atggctcata acaccccttg tattactgtt tatgtaagca gacagtttta ttgttcatga 8940
tgatatattt ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc 9000
ccccccccc cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt 9060
tgaatgtatt tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc 9120
acctgacgtc taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac 9180
gaggcccttt cgtc 9194

<210> 164
<211> 9194
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 164
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800

cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgccccgg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaatttttt 3180
agggaagatc tggccttccc acaagggaag gccagggaat tttcttcaga gcagaccaga 3240
gccaacagcc ccaccagaag agagcttcag gtttggggaa gagacaacaa ctccctctca 3300
gaagcaggag ccgatagaca aggaactgta tcctttagct tccctcagat cactctttgg 3360
cagcgacccc tcgtcacaat aaagataggg ggccagctga aggaggccct tctagacacc 3420
ggcgccgacg acaccgtgct ggaggagatg aacctgcccg gccgctggaa gcccaagatg 3480
atcggcggca tcggcggctt catcaaggtg ggccagtacg accagatcct gatcgagatc 3540
tgcggccaca aggccatcgg caccgtgctg gtgggcccca cccccgtgaa catcatcggc 3600
cgcaacctgc tgacccagat cggctgcacc ctgaacttcc ccatcagccc catcgagacc 3660
gtgcccgtga agctgaagcc cggcatggac ggccccaagg tgaagcagtg gcccctgacc 3720
gaggagaaga tcaaggccct ggtggagatc tgcaccgaga tggagaagga gggcaagatc 3780
agcaagatcg gccccgagaa ccctacaac accccgtgt tcgccatcaa gaagaaggac 3840
agcaccaagt ggcgcaagct ggtggacttc cgcgagctga acaagcgcac ccaggacttc 3900
tgggaggtgc agctgggcat ccccacccc gccggcctga agcagaagaa gagcgtgacc 3960
gtgctggacg tgggcgacgc ctacttcagc gtgccctgg acaaggactt ccgcaagtac 4020
accgccttca ccatccccag catcaacaac gagaccccg gcatccgcta ccagtacaac 4080
gtgctgcccc agggctggaa gggcagcccc gccatcttcc agtgcagcat gaccaagatc 4140
ctggagccct tccgcaagca gaaccccgac atcgtgatct accagtacat ggaccacctg 4200
tacgtgggca gcgacctgga gatcggccag caccgcacca agatcgagga gctgcgccag 4260
cacctgctgc gctggggctt caccacccc gacaagaagc accagaagga gccccccttc 4320
ctgtggatgg gctacgagct gcaccccgac aagtggaccg tgcagcccat cgtgctgccc 4380
gagaaggaca gctggaccgt gaacgacatc cagaagctgg tgggcaagct gaactgggcc 4440
agccagatct acgccggcat caaggtgcgc cagctgtgca agctgctgcg cggcaccaag 4500
gccctgaccg aggtggtgcc cctgaccgag gaggccgagc tggagctggc cgagaaccgc 4560
gagatcctga aggagcccgt gcacggcgtg tactacgacc ccagcaagga cctgatcgcc 4620
gagatccaga agcagggcca gggccagtgg acctaccaga tctaccagga gcccttcaag 4680
aacctgaaga ccggcaagta cgcccgcatg aagggcgccc acaccaacga cgtgaagcag 4740
ctgaccgagg ccgtgcagaa gatcgccacc gagagcatcg tgatctgggg caagaccccc 4800
aagttcaagc tgcccatcca gaaggagacc tgggaggcct ggtggaccga gtactggcag 4860
gccacctgga tccccgagtg ggagttcgtg aacaccccc ccctggtgaa gctgtggtac 4920
cagctggaga aggagcccat catcggcgcc gagaccttct acgtggacgg cgccgccaac 4980
cgcgagacca agctgggcaa ggccggctac gtgaccgacc gcggccgcca gaaggtggtg 5040
cccctgaccg acaccaccaa ccagaagacc gagctgcagg ccatccacct ggccctgcag 5100

gacagcggcc tggaggtgaa catcgtgacc gacagccagt acgccctggg catcatccag 5160
gcccagcccg acaagagcga gagcgagctg gtgagccaga tcatcgagca gctgatcaag 5220
aaggagaagg tgtacctggc ctgggtgccc gcccacaagg gcatcggcgg caacgagcag 5280
gtggacggcc tggtgagcgc cggcatccgc aaggtgctgt tcctggacgg catcgacaag 5340
gcccaggagg agcacgagaa gtaccacagc aactggcgcg ccatggccag cgacttcaac 5400
ctgccccccg tggtggccaa ggagatcgtg gccagctgcg acaagtgcca gctgaagggc 5460
gaggccatgc acggccaggt ggactgcagc cccggcatct ggcagctggc atgcacccac 5520
ctggagggca aggtgatcct ggtggccgtg cacgtggcca gcggctacat cgaggccgag 5580
gtgatccccg ccgagaccgg ccaggagacc gcctacttcc tgctgaagct ggccggccgc 5640
tggcccgtga agaccgtgca caccgacaac ggcagcaact tcaccagcac caccgtgaag 5700
gccgcctgct ggtgggccgg catcaagcag gagttcggca tcccctacaa cccccagagc 5760
cagggcgtga tcgagagcat gaacaaggag ctgaagaaga tcatcggcca ggtgcgcgac 5820
caggccgagc acctgaagac cgccgtgcag atggccgtgt tcatccacaa cttcaagcgc 5880
aagggcggca tcggcggcta cagcgccggc gagcgcatcg tggacatcat cgccaccgac 5940
atccagacca aggagctgca gaagcagatc accaagatcc agaacttccg cgtgtactac 6000
cgcgacagcc gcgaccccgt gtggaagggc cccgccaagc tgctgtggaa gggcgagggc 6060
gccgtggtga tccaggacaa cagcgacatc aaggtggtgc cccgccgcaa ggccaagatc 6120
atccgcgact acggcaagca gatggccggc gacgactgcg tggccagccg ccaggacgag 6180
gactaggaat tctgctgtgc cttctagttg ccagccatct gttgtttgcc cctcccccgt 6240
gccttccttg accctggaag gtgccactcc cactgtcctt tcctaataaa atgaggaaat 6300
tgcatcgcat tgtctgagta ggtgtcattc tattctgggg ggtggggtgg ggcaggacag 6360
caaggggag gattgggaag acaatagcag gcatgctggg gatgcggtgg gctctatggg 6420
tacccaggtg ctgaagaatt gacccggttc ctcctgggcc agaaagaagc aggcacatcc 6480
ccttctctgt gacacaccct gtccacgccc ctggttctta gttccagccc cactcatagg 6540
acactcatag ctcaggaggg ctccgccttc aatcccaccc gctaaagtac ttggagcggt 6600
ctctccctcc ctcatcagcc caccaaacca aacctagcct ccaagagtgg gaagaaatta 6660
aagcaagata ggctattaag tgcagaggga gagaaaatgc ctccaacatg tgaggaagta 6720
atgagagaaa tcatagaatt ttaaggccat catggcctta atcttccgct tcctcgctca 6780
ctgactcgct gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg 6840
taatacggtt atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc 6900
agcaaaaggc caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc 6960
cccctgacga gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac 7020
tataaagata ccaggcgttt ccccctggaa gctccctcgt gcgctctcct gttccgaccc 7080
tgccgcttac cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcata 7140
gctcacgctg taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc 7200
acgaaccccc cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca 7260
acccggtaag acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag 7320
cgaggtatgt aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta 7380
gaagaacagt atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg 7440
gtagctcttg atccggcaaa caaaccaccg ctggtagcgg tggttttttt gtttgcaagc 7500
agcagattac gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt 7560
ctgacgctca gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa 7620
ggatcttcac ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat 7680
atgagtaaac ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga 7740
tctgtctatt tcgttcatcc atagttgcct gactcggggg gggggggcgc tgaggtctgc 7800
ctcgtgaaga aggtgttgct gactcatacc aggcctgaat cgccccatca tccagccaga 7860
aagtgaggga gccacggttg atgagagctt tgttgtaggt ggaccagttg gtgattttga 7920
acttttgctt tgccacggaa cggtctgcgt tgtcgggaag atgcgtgatc tgatccttca 7980
actcagcaaa agttcgattt attcaacaaa gccgccgtcc cgtcaagtca gcgtaatgct 8040
ctgccagtgt tacaaccaat taaccaattc tgattagaaa aactcatcga gcatcaaatg 8100
aaactgcaat ttattcatat caggattatc aataccatat ttttgaaaaa gccgtttctg 8160
taatgaagga gaaaactcac cgaggcagtt ccataggatg gcaagatcct ggtatcggtc 8220
tgcgattccg actcgtccaa catcaataca acctattaat ttcccctcgt caaaaataag 8280
gttatcaagt gagaaatcac catgagtgac gactgaatcc ggtgagaatg gcaaaagctt 8340
atgcatttct ttccagactt gttcaacagg ccagccatta cgctcgtcat caaaatcact 8400

cgcatcaacc aaaccgttat tcattcgtga ttgcgcctga gcgagacgaa atacgcgatc 8460
gctgttaaaa ggacaattac aaacaggaat cgaatgcaac cggcgcagga acactgccag 8520
cgcatcaaca atattttcac ctgaatcagg atattcttct aatacctgga atgctgtttt 8580
cccggggatc gcagtggtga gtaaccatgc atcatcagga gtacggataa aatgcttgat 8640
ggtcggaaga ggcataaatt ccgtcagcca gtttagtctg accatctcat ctgtaacatc 8700
attggcaacg ctacctttgc catgtttcag aaacaactct ggcgcatcgg gcttcccata 8760
caatcgatag attgtcgcac ctgattgccc gacattatcg cgagcccatt tatacccata 8820
taaatcagca tccatgttgg aatttaatcg cggcctcgag caagacgttt cccgttgaat 8880
atggctcata acaccccttg tattactgtt tatgtaagca gacagtttta ttgttcatga 8940
tgatatattt ttatcttgtg caatgtaaca tcagagattt tgagacacaa cgtggctttc 9000
ccccccccc cattattgaa gcatttatca gggttattgt ctcatgagcg gatacatatt 9060
tgaatgtatt tagaaaaata aacaaatagg ggttccgcgc acatttcccc gaaaagtgcc 9120
acctgacgtc taagaaacca ttattatcat gacattaacc tataaaaata ggcgtatcac 9180
gaggcccttt cgtc 9194

<210> 165
<211> 12411
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 165
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740

gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgccccgg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaatttttt 3180
agggaagatc tggccttccc acaagggaag gccagggaat tttcttcaga gcagaccaga 3240
gccaacagcc ccaccagaag agagcttcag gtttggggaa gagacaacaa ctcccctcca 3300
gaagcaggag ccgatagaca aggaactgta tcctttagct tccctcagat cactctttgg 3360
cagcgacccc tcgtcacaat aaagataggg ggccagctga aggaggccct tctagacacc 3420
ggcgccgacg acaccgtgct ggaggagatg aacctgcccg gccgctggaa gcccaagatg 3480
atcggcggca tcggcggctt catcaaggtg ggccagtacg accagatcct gatcgagatc 3540
tgcggccaca aggccatcgg caccgtgctg gtgggcccca cccccgtgaa catcatcggc 3600
cgcaacctgc tgacccagat cggctgcacc ctgaacttcc ccatcagccc catcgagacc 3660
gtgcccgtga agctgaagcc cggcatggac ggccccaagg tgaagcagtg gcccctgacc 3720
gaggagaaga tcaaggccct ggtggagatc tgcaccgaga tggagaagga gggcaagatc 3780
agcaagatcg gccccgagaa ccctacaac accccctgt tcgccatcaa gaagaaggac 3840
agcaccaagt ggcgcaagct ggtggacttc cgcgagctga acaagcgcac ccaggacttc 3900
tgggaggtgc agctgggcat ccccaccccc gccggcctga agcagaagaa gagcgtgacc 3960
gtgctggacg tgggcgacgc ctacttcagc gtgccctgg acaaggactt ccgcaagtac 4020
accgccttca ccatccccag catcaacaac gagaccccg gcatccgcta ccagtacaac 4080
gtgctgcccc agggctggaa gggcagcccc gccatcttcc agtgcagcat gaccaagatc 4140
ctggagccct tccgcaagca gaaccccgac atcgtgatct accagtacat ggacgacctg 4200
tacgtgggca gcgacctgga gatcggccag caccgcacca agatcgagga gctgcgccag 4260
cacctgctgc gctggggctt caccaccccc gacaagaagc accagaagga gccccccttc 4320
ctgtggatgg gctacgagct gcaccccgac aagtggaccg tgcagcccat cgtgctgccc 4380
gagaaggaca gctggaccgt gaacgacatc cagaagctgg tgggcaagct gaactgggcc 4440
agccagatct acgccggcat caaggtgcgc cagctgtgca agctgctgcg cggcaccaag 4500
gccctgaccg aggtggtgcc cctgaccgag gaggccgagc tggagctggc cgagaaccgc 4560
gagatcctga aggagcccgt gcacggcgtg tactacgacc ccagcaagga cctgatcgcc 4620
gagatccaga agcagggcca gggccagtgg acctaccaga tctaccagga gcccttcaag 4680
aacctgaaga ccggcaagta cgcccgcatg aagggcgccc acaccaacga cgtgaagcag 4740
ctgaccgagg ccgtgcagaa gatcgccacc gagagcatcg tgatctgggg caagacccc 4800
aagttcaagc tgcccatcca gaaggagacc tgggaggcct ggtggaccga gtactggcag 4860
gccacctgga tccccgagtg ggagttcgtg aacaccccc ccctggtgaa gctgtggtac 4920
cagctggaga aggagcccat catcggcgcc gagaccttct acgtggacgg cgccgccaac 4980
cgcgagacca agctgggcaa ggccggctac gtgaccgacc gcggccgcca gaaggtggtg 5040

ccccctgaccg acaccaccaa ccagaagacc gagctgcagg ccatccacct ggccctgcag 5100
gacagcggcc tggaggtgaa catcgtgacc gacagccagt acgccctggg catcatccag 5160
gcccagcccg acaagagcga gagcgagctg gtgagccaga tcatcgagca gctgatcaag 5220
aaggagaagg tgtacctggc ctgggtgccc gcccacaagg gcatcggcgg caacgagcag 5280
gtggacggcc tggtgagcgc cggcatccgc aaggtgctgt tcctggacgg catcgacaag 5340
gcccaggagg agcacgagaa gtaccacagc aactggcgcg ccatggccag cgacttcaac 5400
ctgccccccg tggtggccaa ggagatcgtg gccagctgcg acaagtgcca gctgaagggc 5460
gaggccatgc acggccaggt ggactgcagc cccggcatct ggcagctgga ctgcacccac 5520
ctggagggca aggtgatcct ggtggccgtg cacgtggcca gcggctacat cgaggccgag 5580
gtgatccccg ccgagaccgg ccaggagacc gcctacttcc tgctgaagct ggccggccgc 5640
tggcccgtga agaccgtgca caccgacaac ggcagcaact tcaccagcac caccgtgaag 5700
gccgcctgct ggtgggccgg catcaagcag gagttcggca tcccctacaa cccccagagc 5760
cagggcgtga tcgagagcat gaacaaggag ctgaagaaga tcatcggcca ggtgcgcgac 5820
caggccgagc acctgaagac cgccgtgcag atggccgtgt tcatccacaa cttcaagcgc 5880
aagggcggca tcggcggcta cagcgccggc gagcgcatcg tggacatcat cgccaccgac 5940
atccagacca aggagctgca gaagcagatc accaagatcc agaacttccg cgtgtactac 6000
cgcgacagcc gcgaccccgt gtggaagggc cccgccaagc tgctgtggaa gggcgagggc 6060
gccgtggtga tccaggacaa cagcgacatc aaggtggtgc cccgccgcaa ggccaagatc 6120
atccgcgact acggcaagca gatggccggc gacgactgcg tggccagccg ccaggacgag 6180
gactaggaat tcacgcgtcg agcatgcatc tagggcggcc aattccgccc ctctccctcc 6240
ccccccccta acgttactgg ccgaagccgc ttggaataag gccggtgtgc gtttgtctat 6300
atgtgatttt ccaccatatt gccgtctttt ggcaatgtga gggcccggaa acctggccct 6360
gtcttcttga cgagcattcc taggggtctt tcccctctcg ccaaaggaat gcaaggtctg 6420
ttgaatgtcg tgaaggaagc agttcctctg gaagcttctt gaagacaaac aacgtctgta 6480
gcgacccttt gcaggcagcg gaaccccca cctggcgaca ggtgcctctg cggccaaaag 6540
ccacgtgtat aagatacacc tgcaaaggcg gcacaacccc agtgccacgt tgtgagttgg 6600
atagttgtgg aaagagtcaa atggctctcc tcaagcgtat tcaacaaggg gctgaaggat 6660
gcccagaagg taccccattg tatgggatct gatctggggc ctcggtgcac atgctttaca 6720
tgtgtttagt cgaggttaaa aaaacgtcta ggccccccga accacgggga cgtggttttc 6780
ctttgaaaaa cacgatgata agcttgccac aacccgggat cctctagaac accatgcgcg 6840
tgaaggagaa gtaccagcac ctgtggcgct ggggctggcg ctggggcacc atgctgctgg 6900
gcatgctgat gatctgcagc gccaccgaga agctgtgggt gaccgtgtac tacggcgtgc 6960
ccgtgtggaa ggaggccacc accaccctgt tctgcgccag cgacgccaag gcctacgaca 7020
ccgaggtgca caacgtgtgg gccacccacg cctgcgtgcc caccgacccc aacccccagg 7080
aggtggtgct ggtgaacgtg accgagaact tcgacatgtg gaagaacgac atggtggagc 7140
agatgcacga ggacatcatc agcctgtggg accagagcct gaagccctgc gtgaagctga 7200
ccccctgtg cgtgagcctg aagtgcaccg acctgaagaa cgacaccaac accaacagca 7260
gcagcggccg catgatcatg gagaagggcg agatcaagaa ctgcagcttc aacatcagca 7320
ccagcatccg cggcaaggtg cagaaggagt acgccttctt ctacaagctg gacatcatcc 7380
ccatcgacaa cgacaccacc agctacagcc tgaccagctg caacaccagc gtgatcaccc 7440
aggcctgccc caaggtgagc ttcgagccca tccccatcca ctactgcgcc cccgccggct 7500
tcgccatcct gaagtgcaag gacaagaagt tcaacggcaa gggcccctgc accaacgtga 7560
gcaccgtgca gtgcacccac ggcatccgcc ccgtggtgag cacccagctg ctgctgaacg 7620
gcagcctggc cgaggaggag gtggtgatcc gcagcgccaa cttcgccgac aacgccaagg 7680
tgatcatcgt gcagctgaac gagagcgtgg agatcaactg cacccgcccc aacaacaaca 7740
cccgcaagag catccacatc ggccccggcc gcgccttcta caccaccggc gagatcatcg 7800
gcgacatccg ccaggcccac tgcaacctga gccgcgccaa gtggaacgac accctgaaca 7860
agatcgtgat caagctgcgc gagcagttcg gcaacaagac catcgtgttc aagcacagca 7920
gcggcggcga ccccgagatc gtgacccaca gcttcaactg cggcggcgag ttcttctact 7980
gcaacagcac ccagctgttc aacagcacct ggttcaacag cacctggagc accgagggca 8040
gcaacaacac cgagggcagc gacaccatca ccctgccctg ccgcatcaag cagatcatca 8100
acatgtggca gaaggtgggc aaggccatgt acgccccccc catcagcggc cagatccgct 8160
gcagcagcaa catcaccggc ctgctgctga cccgcgacgg cggcaacagc aacaacgaga 8220
gcgagatctt ccgcctgggc ggcggcgaca tgcgcgacaa ctggcgcagc gagctgtaca 8280
agtacaaggt ggtgaagatc gagcccctgg gcgtggcccc caccaaggcc aagcgccgcg 8340

tggtgcagcg cgagaagcgc gccgtgggca tcggcgccct gttcctgggc ttcctgggcg 8400
ccgccggcag caccatgggc gccgccagca tgaccctgac cgtgcaggcc cgccagctgc 8460
tgagcggcat cgtgcagcag cagaacaacc tgctgcgcgc catcgaggcc cagcagcacc 8520
tgctgcagct gaccgtgtgg ggcatcaagc agctgcaggc ccgcatcctg gccgtggagc 8580
gctacctgaa ggaccagcag ctgctgggca tctggggctg cagcggcaag cttatctgca 8640
ccaccgccgt gccctggaac gccagctgga gcaacaagag cctggagcag atctggaacc 8700
acaccacctg gatggagtgg gaccgcgaga tcaacaacta caccagcctg atccacagcc 8760
tgatcgagga gagccagaac cagcaggaga agaacgagca ggagctgctg gagctggaca 8820
agtgggccag cctgtggaac tggttcaaca tcaccaactg gctgtggtac atcaagctgt 8880
tcatcatgat cgtgggcggc ctggtgggcc tgcgcatcgt gttcgccgtg ctgagcatcg 8940
tgaaccgcgt gcgccagggc tacagccccc tgagcttcca gacccacctg cccatccccc 9000
gcggccccga ccgccccgag ggcatcgagg aggagggcgg cgagcgcgac cgcgaccgca 9060
gcatccgcct ggtgaacggc agcctggccc tgatctggga cgacctgcgc agcctgtgcc 9120
tgttcagcta ccaccgcctg cgcgacctgc tgctgatcgt gacccgcatc gtggagctgc 9180
tgggccgccg cggctgggag gccctgaagt actggtggaa cctgctgcag tactggagcc 9240
aggagctgaa gaacagcgcc gtgagcctgc tgaacgccac cgccatcgcc gtggccgagg 9300
gcaccgaccg cgtgatcgag gtggtgcagg gcgcctgccg cgccatccgc cacatccccc 9360
gccgcatccg ccagggcctg gagcgcatcc tgctgtgagg atccagatct gctgtgcctt 9420
ctagttgcca gccatctgtt gtttgccccc cccccgtgcc ttccttgacc ctggaaggtg 9480
ccactcccac tgtcctttcc taataaaatg aggaaattgc atcgcattgt ctgagtaggt 9540
gtcattctat tctgggggtg ggggtggggc aggacagcaa ggggaggat tgggaagaca 9600
atagcaggca tgctggggat gcggtgggct ctatgggtac ccaggtgctg aagaattgac 9660
ccggttcctc ctgggccaga aagaagcagg cacatccccc tctctgtgac acaccctgtc 9720
cacgcccctg gttcttagtt ccagccccac tcataggaca ctcatagctc aggagggctc 9780
cgccttcaat cccacccgct aaagtacttg gagcggtctc tccctccctc atcagcccac 9840
caaaccaaac ctagcctcca agagtgggaa gaaattaaag caagataggc tattaagtgc 9900
agagggagag aaaatgcctc caacatgtga ggaagtaatg agagaaatca tagaatttta 9960
aggccatcat ggccttaatc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt 10020
cggctgcggc gagcggtatc agctcactca aaggcggtaa tacggttatc cacagaatca 10080
ggggataacg caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa 10140
aaggccgcgt tgctggcgtt tttccatagg ctccgccccc ctgacgagca tcacaaaaat 10200
cgacgctcaa gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc 10260
cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg atacctgtcc 10320
gcctttctcc cttcgggaag cgtggcgctt tctcatagct cacgctgtag gtatctcagt 10380
tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg aacccccgt tcagcccgac 10440
cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg 10500
ccactggcag cagccactgg taacaggatt agcagagcga ggtatgtagg cggtgctaca 10560
gagttcttga agtggtggcc taactacggc tacactagaa gaacagtatt tggtatctgc 10620
gctctgctga agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa 10680
accaccgctg gtagcggtgg tttttttgtt tgcaagcagc agattacgcg cagaaaaaaa 10740
ggatctcaag aagatccttt gatcttttct acggggtctg acgctcagtg gaacgaaaac 10800
tcacgttaag ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta 10860
aattaaaaat gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt 10920
taccaatgct taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata 10980
gttgcctgac tcgggggggg ggggcgctga ggtctgcctc gtgaagaagg tgttgctgac 11040
tcataccagg cctgaatcgc cccatcatcc agccagaaag tgagggagcc acggttgatg 11100
agagctttgt tgtaggtgga ccagttggtg attttgaact tttgctttgc cacggaacgg 11160
tctgcgttgt cgggaagatg cgtgatctga tccttcaact cagcaaaagt tcgatttatt 11220
caacaaagcc gccgtcccgt caagtcagcg taatgctctg ccagtgttac aaccaattaa 11280
ccaattctga ttagaaaaac tcatcgagca tcaaatgaaa ctgcaattta ttcatatcag 11340
gattatcaat accatatttt tgaaaaagcc gtttctgtaa tgaaggagaa aactcaccga 11400
ggcagttcca taggatggca agatcctggt atcggtctgc gattccgact cgtccaacat 11460
caatacaacc tattaatttc ccctcgtcaa aaataaggtt atcaagtgag aaatcaccat 11520
gagtgacgac tgaatccggt gagaatggca aaagcttatg catttctttc cagacttgtt 11580
caacaggcca gccattacgc tcgtcatcaa aatcactcgc atcaaccaaa ccgttattca 11640

ttcgtgattg cgcctgagcg agacgaaata cgcgatcgct gttaaaagga caattacaaa 11700
caggaatcga atgcaaccgg cgcaggaaca ctgccagcgc atcaacaata ttttcacctg 11760
aatcaggata ttcttctaat acctggaatg ctgttttccc ggggatcgca gtggtgagta 11820
accatgcatc atcaggagta cggataaaat gcttgatggt cggaagaggc ataaattccg 11880
tcagccagtt tagtctgacc atctcatctg taacatcatt ggcaacgcta cctttgccat 11940
gtttcagaaa caactctggc gcatcgggct tcccatacaa tcgatagatt gtcgcacctg 12000
attgcccgac attatcgcga gcccatttat acccatataa atcagcatcc atgttggaat 12060
ttaatcgcgg cctcgagcaa gacgtttccc gttgaatatg gctcataaca ccccttgtat 12120
tactgtttat gtaagcagac agttttattg ttcatgatga tatattttta tcttgtgcaa 12180
tgtaacatca gagattttga gacacaacgt ggctttcccc ccccccccat tattgaagca 12240
tttatcaggg ttattgtctc atgagcggat acatatttga atgtatttag aaaaataaac 12300
aaataggggt tccgcgcaca tttccccgaa aagtgccacc tgacgtctaa gaaaccatta 12360
ttatcatgac attaacctat aaaaataggc gtatcacgag gccctttcgt c 12411

<210> 166
<211> 9170
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 166
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800

cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgccccgg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaataggga 3180
agatctggcc ttcccacaag ggaaggccag ggaattttct tcagagcaga ccagagccaa 3240
cagccccacc agaagagagc ttcaggtttg gggaagagac aacaactccc tctcagaagc 3300
aggagccgat agacaaggaa ctgtatcctt tagcttccct cagatcactc tttggcagcg 3360
acccctcgtc acaataaaga taggggccca gctgaaggag gcccttctag acaccggcgc 3420
cgacgacacc gtgctggagg agatgaacct gccccggccgc tggaagccca agatgatcgg 3480
cggcatcggc ggcttcatca aggtgggcca gtacgaccag atcctgatcg agatctgcgg 3540
ccacaaggcc atcggcaccg tgctggtggg ccccaccccc gtgaacatca tcggccgcaa 3600
cctgctgacc cagatcggct gcaccctgaa cttccccatc agccccatcg agaccgtgcc 3660
cgtgaagctg aagcccggca tggacggccc caaggtgaag cagtggcccc tgaccgagga 3720
gaagatcaag gccctggtgg agatctgcac cgagatggag aaggagggca agatcagcaa 3780
gatcggcccc gagaaccct acaacacccc cgtgttcgcc atcaagaaga aggacagcac 3840
caagtggcgc aagctggtgg acttccgcga gctgaacaag cgcacccagg acttctggga 3900
ggtgcagctg ggcatccccc accccgccgg cctgaagcag aagaagagcg tgaccgtgct 3960
ggacgtgggc gacgcctact tcagcgtgcc cctggacaag gacttccgca agtacaccgc 4020
cttcaccatc cccagcatca acaacgagac ccccggcatc cgctaccagt acaacgtgct 4080
gccccagggc tggaagggca gccccgccat cttccagtgc agcatgacca agatcctgga 4140
gcccttccgc aagcagaacc ccgacatcgt gatctaccag tacatggacc acctgtacgt 4200
gggcagcgac ctggagatcg gccagcaccg caccaagatc gaggagctgc gccagcacct 4260
gctgcgctgg ggcttcacca cccccgacaa gaagcaccag aaggagcccc ccttcctgtg 4320
gatgggctac gagctgcacc ccgacaagtg gaccgtgcag cccatcgtgc tgcccgagaa 4380
ggacagctgg accgtgaacg acatccagaa gctggtgggc aagctgaact gggccagcca 4440
gatctacgcc ggcatcaagg tgcgccagct gtgcaagctg ctgcgcggca ccaaggccct 4500
gaccgaggtg gtgcccctga ccgaggaggc cgagctggag ctggccgaga accgcgagat 4560
cctgaaggag cccgtgcacg gcgtgtacta cgaccccagc aaggacctga tcgccgagat 4620
ccagaagcag ggccagggcc agtggaccta ccagatctac caggagccct tcaagaacct 4680
gaagaccggc aagtacgccc gcatgaaggg cgcccacacc aacgacgtga agcagctgac 4740
cgaggccgtg cagaagatcg ccaccgagag catcgtgatc tggggcaaga cccccaagtt 4800
caagctgccc atccagaagg agacctggga ggcctggtgg accgagtact ggcaggccac 4860
ctggatcccc gagtgggagt tcgtgaacac ccccccctg gtgaagctgt ggtaccagct 4920
ggagaaggag cccatcatcg gcgccgagac cttctacgtg gacggcgccg ccaaccgcga 4980
gaccaagctg ggcaaggccg gctacgtgac cgaccgcggc cgccagaagg tggtgcccct 5040
gaccgacacc accaaccaga agaccgagct gcaggccatc cacctggccc tgcaggacag 5100

cggcctggag gtgaacatcg tgaccgacag ccagtacgcc ctgggcatca tccaggccca 5160
gcccgacaag agcgagagcg agctggtgag ccagatcatc gagcagctga tcaagaagga 5220
gaaggtgtac ctggcctggg tgcccgccca caagggcatc ggcggcaacg agcaggtgga 5280
cggcctggtg agcgccggca tccgcaaggt gctgttcctg gacggcatcg acaaggccca 5340
ggaggagcac gagaagtacc acagcaactg gcgcgccatg gccagcgact tcaacctgcc 5400
ccccgtggtg gccaaggaga tcgtggccag ctgcgacaag tgccagctga agggcgaggc 5460
catgcacggc caggtggact gcagccccgg catctggcag ctggcatgca cccacctgga 5520
gggcaaggtg atcctggtgg ccgtgcacgt ggccagcggc tacatcgagg ccgaggtgat 5580
ccccgccgag accggccagg agaccgccta cttcctgctg aagctggccg gccgctggcc 5640
cgtgaagacc gtgcacaccg acaacggcag caacttcacc agcaccaccg tgaaggccgc 5700
ctgctggtgg gccggcatca agcaggagtt cggcatcccc tacaaccccc agagccaggg 5760
cgtgatcgag agcatgaaca aggagctgaa gaagatcatc ggccaggtgc gcgaccaggc 5820
cgagcacctg aagaccgccg tgcagatggc cgtgttcatc cacaacttca agcgcaaggg 5880
cggcatcggc ggctacagcg ccggcgagcg catcgtggac atcatcgcca ccgacatcca 5940
gaccaaggag ctgcagaagc agatcaccaa gatccagaac ttccgcgtgt actaccgcga 6000
cagccgcgac cccgtgtgga agggccccgc caagctgctg tggaagggcg agggcgccgt 6060
ggtgatccag gacaacagcg acatcaaggt ggtgccccgc cgcaaggcca agatcatccg 6120
cgactacggc aagcagatgg ccggcgacga ctgcgtggcc agccgccagg acgaggacta 6180
ggaattcttg ctgtgccttc tagttgccag ccatctgttg tttgccccтc ccccgtgcct 6240
tccttgaccc tggaaggtgc cactcccact gtcctttcct aataaaatga ggaaattgca 6300
tcgcattgtc tgagtaggtg tcattctatt ctgggggggtg gggtggggca gcacagcaag 6360
ggggaggatt gggaagacaa tagcaggcat gctggggatg cggtgggctc tatgggtacc 6420
caggtgctga agaattgacc cggttcctcc tgggccagaa agaagcaggc acatcccctt 6480
ctctgtgaca caccctgtcc acgcccctgg ttcttagttc cagccccact cataggacac 6540
tcatagctca ggagggctcc gccttcaatc ccacccgcta aagtacttgg agcggtctct 6600
ccctccctca tcagcccacc aaaccaaacc tagcctccaa gagtgggaag aaattaaagc 6660
aagataggct attaagtgca gagggagaga aaatgcctcc aacatgtgag gaagtaatga 6720
gagaaatcat agaatttctt ccgcttcctc gctcactgac tcgctgcgct cggtcgttcg 6780
gctgcggcga gcggtatcag ctcactcaaa ggcggtaata cggttatcca cagaatcagg 6840
ggataacgca ggaaagaaca tgtgagcaaa aggccagcaa aaggccagga accgtaaaaa 6900
ggccgcgttg ctggcgtttt tccataggct ccgccccccт gacgagcatc acaaaaatcg 6960
acgctcaagt cagaggtggc gaaacccgac aggactataa agataccagg cgtttccccc 7020
tggaagctcc ctcgtgcgct ctcctgttcc gaccctgccg cttaccggat acctgtccgc 7080
ctttctccct tcgggaagcg tggcgctttc tcaatgctca cgctgtaggt atctcagttc 7140
ggtgtaggtc gttcgctcca agctgggctg tgtgcacgaa ccccccgttc agcccgaccg 7200
ctgcgcctta tccggtaact atcgtcttga gtccaacccg gtaagacacg acttatcgcc 7260
actggcagca gccactggta acaggattag cagagcgagg tatgtaggcg gtgctacaga 7320
gttcttgaag tggtggccta actacggcta cactagaagg acagtatttg gtatctgcgc 7380
tctgctgaag ccagttacct tcggaaaaag agttggtagc tcttgatccg gcaaacaaac 7440
caccgctggt agcggtggtt tttttgtttg caagcagcag attacgcgca gaaaaaaagg 7500
atctcaagaa gatcctttga tcttttctac ggggtctgac gctcagtgga acgaaaactc 7560
acgttaaggg attttggtca tgagattatc aaaaaggatc ttcacctaga tccttttaaa 7620
ttaaaaatga agttttaaat caatctaaag tatatatgag taaacttggt ctgacagtta 7680
ccaatgctta atcagtgagg cacctatctc agcgatctgt ctatttcgtt catccatagt 7740
tgcctgactc cgggggggg gggcgctgag gtctgcctcg tgaagaaggt gttgctgact 7800
cataccaggc ctgaatcgcc ccatcatcca gccagaaagt gagggagcca cggttgatga 7860
gagctttgtt gtaggtggac cagttggtga ttttgaactt ttgctttgcc acggaacggt 7920
ctgcgttgtc gggaagatgc gtgatctgat ccttcaactc agcaaaagtt cgatttattc 7980
aacaaagccg ccgtcccgtc aagtcagcgt aatgctctgc cagtgttaca accaattaac 8040
caattctgat tagaaaaact catcgagcat caaatgaaac tgcaatttat tcatatcagg 8100
attatcaata ccatattttt gaaaaagccg tttctgtaat gaaggagaaa actcaccgag 8160
gcagttccat aggatggcaa gatcctggta tcggtctgcg attccgactc gtccaacatc 8220
aatacaacct attaatttcc cctcgtcaaa aataaggtta tcaagtgaga aatcaccatg 8280
agtgacgact gaatccggtg agaatggcaa aagcttatgc atttctttcc agacttgttc 8340
aacaggccag ccattacgct cgtcatcaaa atcactcgca tcaaccaaac cgttattcat 8400

tcgtgattgc gcctgagcga gacgaaatac gcgatcgctg ttaaaaggac aattacaaac 8460
aggaatcgaa tgcaaccggc gcaggaacac tgccagcgca tcaacaatat tttcacctga 8520
atcaggatat tcttctaata cctggaatgc tgttttcccg gggatcgcag tggtgagtaa 8580
ccatgcatca tcaggagtac ggataaaatg cttgatggtc ggaagaggca taaattccgt 8640
cagccagttt agtctgacca tctcatctgt aacatcattg gcaacgctac ctttgccatg 8700
tttcagaaac aactctggcg catcgggctt cccatacaat cgatagattg tcgcacctga 8760
ttgcccgaca ttatcgcgag cccatttata cccatataaa tcagcatcca tgttggaatt 8820
taatcgcggc ctcgagcaag acgtttcccg ttgaatatgg ctcataacac cccttgtatt 8880
actgtttatg taagcagaca gttttattgt tcatgatgat atatttttat cttgtgcaat 8940
gtaacatcag agattttgag acacaacgtg gctttccccc ccccccccatt attgaagcat 9000
ttatcagggt tattgtctca tgagcggata catatttgaa tgtatttaga aaaataaaca 9060
aatagggggtt ccgcgcacat ttccccgaaa agtgccacct gacgtctaag aaaccattat 9120
tatcatgaca ttaacctata aaaataggcg tatcacgagg ccctttcgtc 9170

<210> 167
<211> 9280
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing SIV genes

<400> 167
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800

cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgacg ccgccaccat gggcgtgcgc aacagcgtgc tgagcggcaa 1920
gaaggccgac gagctggaga agatccgcct gcgcccgaac ggcaagaaga agtacatgct 1980
gaagcacgtg gtgtgggccg ccaacgagct ggaccgcttc ggcctggccg agagcctgct 2040
ggagaacaag gagggctgcc agaagatcct gagcgtgctg gcgccgctgg tgcccaccgg 2100
cagcgagaac ctgaagagcc tgtacaacac cgtgtgcgtg atctggtgca tccacgccga 2160
ggagaaggtg aagcacaccg aggaggccaa gcagatcgtg cagcgccacc tggtggtgga 2220
gaccggcacc accgagacca tgcccaagac cagccgcccg accgcgccca gcagcggacg 2280
cggcggcaac tacccggtgc agcagatcgg cggcaactac gtgcacctgc cgctgagccc 2340
gcgcaccctg aacgcctggg tgaagctgat cgaggagaag aagttcggcg ccgaggtggt 2400
gcccggcttc caggccctga gcgagggctg cacgccctac gacatcaacc agatgctgaa 2460
ctgcgtgggc gaccaccagg ccgccatgca gatcatccgc gacatcatca acgaggaggc 2520
cgccgactgg gacctgcagc acccgcagcc cgcgccgcag cagggccagc tgcgcgagcc 2580
cagcggcagc gacatcgccg gcaccaccag cagcgtggac gagcagatcc agtggatgta 2640
ccgccagcag aacccgatcc cggtgggcaa catctaccgc cgctggatac agctgggcct 2700
gcagaagtgc gtgcgcatgt acaacccgac caacatcctg gacgtgaagc agggcccgaa 2760
ggagcccttc cagagctacg tggaccgctt ctacaagagc ctgcgcgccg agcagaccga 2820
cgccgccgtg aagaactgga tgacccagac cctgctgatc cagaacgcca acccggactg 2880
caagctggtg ctgaagggcc tgggcgtgaa cccgaccctg gaggagatgc tgaccgcctg 2940
ccagggcgtg ggcggcccgg gccagaaggc ccgcctgatg gccgaggccc tgaaggaggc 3000
cctggcgccc gtgcccatcc cgttcgcggc cgcccagcag cgcggcccgc gcaagcccat 3060
caagtgctgg aactgcggca aggagggcca cagcgcccgc cagtgccgcg cgccgcgccg 3120
ccagggctgc tggaagtgcg gcaagatgga ccacgtgatg gccaagtgcc cggaccgcca 3180
ggcgggtagg ccttggtcca tggggaaaga agccgcgcaa tttcccgatg gctcaagtgc 3240
atcaggggct gatgccaact gctccgccag aggacccagc tgtggatctg ctaaagaact 3300
acatgcagtt gggcaagcag cagagagaaa agcagagaga aagcagagag aagccttaca 3360
aggaggtgac agaggatttg ctgcacctca attctctctt tggaggagac cagtagtcac 3420
tgcatcgatc gagggccagc ccgtggaggt gcttctagac accggcgccg acgacagcat 3480
cgtgaccggc atcgagctgg gcccgcacta caccccgaag atcgtgggcg gcatcggcgg 3540
cttcatcaac accggagagt acaagaacgt ggagatcgag gtgctgggca agcgcatcaa 3600
gggcaccatc atgaccggcg acacgcccat caacatcttc ggccgcaacc tgctgaccgc 3660
cctgggcatg agcctgaact tccccatcgc caaggtggag cccgtgaagg tggccctgaa 3720
gcccggcaag gacggcccca agctgaagca gtggcccctg agcaaggaga agatcgtggc 3780
cctgcgcgag atctgcgaga agatggagaa ggacggccag ctggaggagg ccccacccac 3840
caacccctac aacacgccca ccttcgccat caagaagaag gacaagaaca agtggcgcat 3900
gctgatcgac ttccgcgagc tgaaccgcgt gacccaggac ttcaccgagg tgcagctggg 3960
catcccgcac cccgccggcc tggccaagcg caagcgcatc accgtgctgg acatcggcga 4020
cgcctacttc agcatccccc tggacgagga gttccgccag tacaccgcct tcaccctgcc 4080
cagcgtgaac aacgccgagc ccggcaagcg ctacatctac aaggtgctgc cccagggctg 4140
gaagggcagc cccgccatct tccagtacac catgcgccac gtgctggagc ccttccgcaa 4200
ggccaacccc gacgtgaccc tggtgcagta catgcatgac atcctgatcg ccagcgaccg 4260
caccgacctg gagcacgacc gcgtggtgct gcagagcaag gagctgctga acagcatcgg 4320
cttcagcacg cccgaggaga agttccagaa ggacccaccc ttccagtgga tgggctacga 4380
gctgtggccc accaagtgga agctgcagaa gatcgagctg ccccagcgcg agacctggac 4440
cgtgaacgac atccagaagc tggtgggcgt gctgaactgg gccgcccaga tctaccccgg 4500
catcaagacc aagcacctgt gccgcctgat ccgcggcaag atgaccctga ccgaggaggt 4560
gcagtggacc gagatggccg aggccgagta cgaggagaac aagatcatcc tgagccagga 4620
gcaggagggc tgctactacc aggagggcaa gcccctggag gccaccgtga tcaagagcca 4680
ggacaaccag tggagctaca agatccacca ggaggacaag atcctgaagg tgggcaagtt 4740
cgccaagatc aagaacaccc acaccaacgg cgtgcgcctg ctggcccacg tgatccagaa 4800
gatcggcaag gaggccatcg tgatctgggg ccaggtgccc aagttccacc tgcccgtgga 4860
gaaggacgtg tgggagcagt ggtggaccga ctactggcag gtgacctgga tacccgagtg 4920
ggacttcatc agcacccctc ccctggtgcg cctggtgttc aacctggtga aggaccccat 4980
cgagggcgag gagacctact acaccgacgg cagctgcaac aagcagagca aggagggcaa 5040
ggccggctac atcaccgacc gcggcaagga caaggtgaag gtgctggagc agaccaccaa 5100

ccagcaggcc gagctcgagg ccttcctgat ggccctgacc gacagcggcc ccaaggccaa 5160
catcatcgtg gacagccagt acgtgatggg catcatcacc ggctgcccca ccgagagcga 5220
gagccgcctg gtgaaccaga tcatcgagga gatgatcaag aagagcgaga tctacgtggc 5280
ctgggtgccc gcccacaagg gcatcggcgg caaccaggag atcgaccacc tggtgagcca 5340
gggcatccgc caggtgctgt tcctggagaa gatcgagccc gcccaggagg agcacgacaa 5400
gtaccacagc aacgtgaagg agctggtgtt caagttcggc ctgccccgca tcgtggcccg 5460
ccagatcgtg gacacctgcg acaagtgcca ccagaagggc gaggccatcc acggccaggc 5520
caacagcgac ctgggcacct ggcagatggc ctgcacccac ctggagggca agatcatcat 5580
cgtggccgtg cacgtggcca gcggcttcat cgaggccgag gtgatcccgc aggagaccgg 5640
ccgccagacc gccctgttcc tgctgaagct ggccggccgc tggcccatca cccacctgca 5700
caccgacaac ggcgccaact tcgccagcca ggaggtgaag atggtggcct ggtgggccgg 5760
catcgagcac accttcggcg tgccctacaa cccgcagagc cagggcgtgg tggaggccat 5820
gaaccaccac ctgaagaacc agatcgaccg catccgcgag caggccaaca gcgtggagac 5880
catcgtgctg atggccgtgc actgcatgaa cttcaagcgc cgcggcggca tcggcgacat 5940
gacgcccgcc gagcgcctga tcaacatgat caccaccgag caggagatcc agttccagca 6000
gagcaagaac agcaagttca agaacttccg cgtgtactac cgcgagggcc gcgaccagct 6060
gtggaagggc cccggcgagc tgctgtggaa gggcgagggc gccgtgatcc tgaaggtggg 6120
caccgacatc aaggtggtgc cccgccgcaa ggccaagatc atcaaggact acggcggcgg 6180
caaggaggtg gacagcagca gccacatgga ggacaccggc gaggcccgcg aggtggcctg 6240
agaattcgtt taaacacgcg tgtatacgga tccagatctg ctgtgccttc tagttgccag 6300
ccatctgttg tttgccccctc ccccgtgcct tccttgaccc tggaaggtgc cactcccact 6360
gtcctttcct aataaaatga ggaaattgca tcgcattgtc tgagtaggtg tcattctatt 6420
ctgggggggtg gggtggggca ggacagcaag ggggaggatt gggaagacaa tagcaggcat 6480
gctggggatg cggtgggctc tatgggtacc caggtgctga agaattgacc cggttcctcc 6540
tgggccagaa agaagcaggc acatcccctt ctctgtgaca caccctgtcc acgcccctgg 6600
ttcttagttc cagccccact cataggacac tcatagctca ggagggctcc gccttcaatc 6660
ccacccgcta aagtacttgg agcggtctct ccctccctca tcagcccacc aaaccaaacc 6720
tagcctccaa gagtgggaag aaattaaagc aagataggct attaagtgca gagggagaga 6780
aaatgcctcc aacatgtgag gaagtaatga gagaaatcat agaatttttaa ggccatcatg 6840
gccttaatct tccgcttcct cgctcactga ctcgctgcgc tcggtcgttc ggctgcggcg 6900
agcggtatca gctcactcaa aggcggtaat acggttatcc acagaatcag gggataacgc 6960
aggaaagaac atgtgagcaa aaggccagca aaaggccagg aaccgtaaaa aggccgcgtt 7020
gctggcgttt ttccataggc tccgcccccc tgacgagcat cacaaaaatc gacgctcaag 7080
tcagaggtgg cgaaacccga caggactata aagataccag gcgtttcccc ctggaagctc 7140
cctcgtgcgc tctcctgttc cgaccctgcc gcttaccgga tacctgtccg cctttctccc 7200
ttcgggaagc gtggcgcttt ctcatagctc acgctgtagg tatctcagtt cggtgtaggt 7260
cgttcgctcc aagctgggct gtgtgcacga acccccccgtt cagcccgacc gctgcgcctt 7320
atccggtaac tatcgtcttg agtccaaccc ggtaagacac gacttatcgc cactggcagc 7380
agccactggt aacaggatta gcagagcgag gtatgtaggc ggtgctacag agttcttgaa 7440
gtggtggcct aactacggct acactagaag aacagtattt ggtatctgcg ctctgctgaa 7500
gccagttacc ttcggaaaaa gagttggtag ctcttgatcc ggcaaacaaa ccaccgctgg 7560
tagcggtggt ttttttgttt gcaagcagca gattacgcgc agaaaaaaag gatctcaaga 7620
agatcctttg atcttttcta cggggtctga cgctcagtgg aacgaaaact cacgttaagg 7680
gattttggtc atgagattat caaaaaggat cttcacctag atccttttaa attaaaaatg 7740
aagttttaaa tcaatctaaa gtatatatga gtaaacttgg tctgacagtt accaatgctt 7800
aatcagtgag gcacctatct cagcgatctg tctatttcgt tcatccatag ttgcctgact 7860
cgggggggggg gggcgctgag gtctgcctcg tgaagaaggt gttgctgact cataccaggc 7920
ctgaatcgcc ccatcatcca gccagaaagt gagggagcca cggttgatga gagctttgtt 7980
gtaggtggac cagttggtga ttttgaactt ttgctttgcc acggaacggt ctgcgttgtc 8040
gggaagatgc gtgatctgat ccttcaactc agcaaaagtt cgatttattc aacaaagccg 8100
ccgtcccgtc aagtcagcgt aatgctctgc cagtgttaca accaattaac caattctgat 8160
tagaaaaact catcgagcat caaatgaaac tgcaatttat tcatatcagg attatcaata 8220
ccatatttttt gaaaaagccg tttctgtaat gaaggagaaa actcaccgag gcagttccat 8280
aggatggcaa gatcctggta tcggtctgcg attccgactc gtccaacatc aatacaacct 8340
attaatttcc cctcgtcaaa aataaggtta tcaagtgaga aatcaccatg agtgacgact 8400

gaatccggtg agaatggcaa aagcttatgc atttctttcc agacttgttc aacaggccag 8460
ccattacgct cgtcatcaaa atcactcgca tcaaccaaac cgttattcat tcgtgattgc 8520
gcctgagcga gacgaaatac gcgatcgctg ttaaaaggac aattacaaac aggaatcgaa 8580
tgcaaccggc gcaggaacac tgccagcgca tcaacaatat tttcacctga atcaggatat 8640
tcttctaata cctggaatgc tgttttcccg gggatcgcag tggtgagtaa ccatgcatca 8700
tcaggagtac ggataaaatg cttgatggtc ggaagaggca taaattccgt cagccagttt 8760
agtctgacca tctcatctgt aacatcattg gcaacgctac ctttgccatg tttcagaaac 8820
aactctggcg catcgggctt cccatacaat cgatagattg tcgcacctga ttgcccgaca 8880
ttatcgcgag cccatttata cccatataaa tcagcatcca tgttggaatt taatcgcggc 8940
ctcgagcaag acgtttcccg ttgaatatgg ctcataacac cccttgtatt actgtttatg 9000
taagcagaca gttttattgt tcatgatgat atatttttat cttgtgcaat gtaacatcag 9060
agattttgag acacaacgtg gctttccccc ccccccattt attgaagcat ttatcagggt 9120
tattgtctca tgagcggata catatttgaa tgtatttaga aaaataaaca aatagggggtt 9180
ccgcgcacat ttccccgaaa agtgccacct gacgtctaag aaaccattat tatcatgaca 9240
ttaacctata aaaataggcg tatcacgagg ccctttcgtc 9280

<210> 168
<211> 9166
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 168
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680

gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcatc ctgcgcggcg gcaagctgga 1920
cgcctgggag cgcatcaagc tgaagcccgg cggcaagaag cactacatga tgaagcacct 1980
ggtgtgggcc agccgcgagc tggagcgctt cgccctggac cccggcctgc tggagaccag 2040
cgagggctgc aagcagatca tgaagcagct gcagcccgcc ctgcagaccg gcaccaagga 2100
gctgatcagc ctgcacaaca ccgtggccac cctgtactgc gtgcacgaga agatcgacgt 2160
gcgcgacacc aaggaggccc tggacaagat caaggaggag cagaacaaga gccagcagaa 2220
gacccagcag gccgaggccg ccgacaaggg caaggtgagc cagaactacc ccatcgtgca 2280
gaacctgcag ggccagatgg tgcaccagcc catcagcgcc cgcaccctga acgcctgggt 2340
gaaggtggtg gaggagaagg ccttcagccc cgaggtgatc cccatgttca ccgccctgag 2400
cgagggcgcc acccccccagg acctgaacac catgctgaac accgtgggcg gccaccaggc 2460
cgccatgcag atgctgaagg acaccatcaa cgaggaggcc gccgagtggg accgcctgca 2520
ccccgtgcac gccggccccg tggcccccgg ccagatgcgc gagccccgcg gcagcgacat 2580
cgccggcacc accagcaccc tgcaggagca gatcacctgg atgaccaaca acccccccgt 2640
gcccgtgggc gacatctaca agcgctggat catcctgggc ctgaacaaga tcgtgcgcat 2700
gtacagcccc gtgagcatcc tggacatcaa gcagggcccc aaggagccct tccgcgacta 2760
cgtggaccgc ttcttcaaga ccctgcgcgc cgagcaggcc acccaggacg tgaagaactg 2820
gatgaccgac accctgctgg tgcagaacgc caaccccgac tgcaagacca tcctgcgcgc 2880
cctgggcccc ggcgccagcc tggaggagat gatgaccgcc tgccagggcg tgggcggccc 2940
cggccacaag gcccgcgtgc tggccgaggc catgagcaag gtgaacaaca ccaacatcat 3000
gatgcagcgc agcaactgca agggccccaa gcgcaccatc aagtgcttca actgcggcaa 3060
ggagggccac ctggcccgca actgccgcgc cccccgcaag aagggctgct ggaagtgcgg 3120
caaggagggc caccaggtga aggactgcac cgagcgacag gctaattttt tagggaagat 3180
ctggccttcc cacaagggaa ggccagggaa ttttcttcag agcagaccag agccaacagc 3240
cccaccagaa gagagcttca ggtttgggga agagacaaca actccctctc agaagcagga 3300
gccgatagac aaggaactgt atcctttagc ttccctcaga tcactctttg gcagcgaccc 3360
ctcgtcacaa taaagatagg gggccagctg aaggaggccc ttctagacac cggcgccgac 3420
gacaccgtgc tggaggagat gaacctgccc ggccgctgga agcccaagat gatcggcggc 3480
atcggcggct tcatcaaggt gggccagtac gaccagatcc tgatcgagat ctgcggccac 3540
aaggccatcg gcaccgtgct ggtgggcccc acccccgtga acatcatcgg ccgcaacctg 3600
ctgacccaga tcggctgcac cctgaacttc cccatcagcc ccatcgagac cgtgcccgtg 3660
aagctgaagc ccggcatgga cggccccaag gtgaagcagt ggcccctgac cgaggagaag 3720
atcaaggccc tggtggagat ctgcaccgag atggagaagg agggcaagat cagcaagatc 3780
ggccccgaga acccctacaa caccccgtg ttcgccatca agaagaagga cagcaccaag 3840
tggcgcaagc tggtggactt ccgcgagctg aacaagcgca cccaggactt ctgggaggtg 3900
cagctgggca tcccccaccc cgccggcctg aagcagaaga agagcgtgac cgtgctggac 3960
gtgggcgacg cctacttcag cgtgcccctg gacaaggact tccgcaagta caccgccttc 4020
accatcccca gcatcaacaa cgagacccc ggcatccgct accagtacaa cgtgctgccc 4080
cagggctgga agggcagccc cgccatcttc cagtgcagca tgaccaagat cctggagccc 4140
ttccgcaagc agaaccccga catcgtgatc taccagtaca tggaccacct gtacgtgggc 4200
agcgacctgg agatcggcca gcaccgcacc aagatcgagg agctgcgcca gcacctgctg 4260
cgctggggct tcaccacccc cgacaagaag caccagaagg agccccccctt cctgtggatg 4320
ggctacgagc tgcaccccga caagtggacc gtgcagccca tcgtgctgcc cgagaaggac 4380
agctggaccg tgaacgacat ccagaagctg gtgggcaagc tgaactgggc cagccagatc 4440
tacgccggca tcaaggtgcg ccagctgtgc aagctgctgc gcggcaccaa ggccctgacc 4500
gaggtggtgc ccctgaccga ggaggccgag ctggagctgg ccgagaaccg cgagatcctg 4560
aaggagcccg tgcacggcgt gtactacgac cccagcaagg acctgatcgc cgagatccag 4620
aagcagggcc agggccagtg gacctaccag atctaccagg agcccttcaa gaacctgaag 4680
accggcaagt acgcccgcat gaagggcgcc cacaccaacg acgtgaagca gctgaccgag 4740
gccgtgcaga agatcgccac cgagagcatc gtgatctggg gcaagacccc caagttcaag 4800
ctgcccatcc agaaggagac ctgggaggcc tggtggaccg agtactggca ggccacctgg 4860
atccccgagt gggagttcgt gaacaccccc cccctggtga agctgtggta ccagctggag 4920
aaggagccca tcatcggcgc cgagaccttc tacgtggacg gcgccgccaa ccgcgagacc 4980

aagctgggca aggccggcta cgtgaccgac cgcggccgcc agaaggtggt gcccctgacc 5040
gacaccacca accagaagac cgagctgcag gccatccacc tggccctgca ggacagcggc 5100
ctggaggtga acatcgtgac cgacagccag tacgccctgg gcatcatcca ggcccagccc 5160
gacaagagcg agagcgagct ggtgagccag atcatcgagc agctgatcaa gaaggagaag 5220
gtgtacctgg cctgggtgcc cgcccacaag ggcatcggcg gcaacgagca ggtggacggc 5280
ctggtgagcg ccggcatccg caaggtgctg ttcctggacg gcatcgacaa ggcccaggag 5340
gagcacgaga agtaccacag caactggcgc gccatggcca gcgacttcaa cctgcccccc 5400
gtggtggcca aggagatcgt ggccagctgc gacaagtgcc agctgaaggg cgaggccatg 5460
cacggccagg tggactgcag ccccggcatc tggcagctgg catgcaccca cctggagggc 5520
aaggtgatcc tggtggccgt gcacgtggcc agcggctaca tcgaggccga ggtgatcccc 5580
gccgagaccg gccaggagac cgcctacttc ctgctgaagc tggccggccg ctggcccgtg 5640
aagaccgtgc acaccgacaa cggcagcaac ttcaccagca ccaccgtgaa ggccgcctgc 5700
tggtgggccg gcatcaagca ggagttcggc atcccctaca accccagag ccagggcgtg 5760
atcgagagca tgaacaagga gctgaagaag atcatcggcc aggtgcgcga ccaggccgag 5820
cacctgaaga ccgccgtgca gatggccgtg ttcatccaca acttcaagcg caagggcggc 5880
atcggcggct acagcgccgg cgagcgcatc gtggacatca tcgccaccga catccagacc 5940
aaggagctgc agaagcagat caccaagatc cagaacttcc gcgtgtacta ccgcgacagc 6000
cgcgaccccg tgtggaaggg ccccgccaag ctgctgtgga agggcgaggg cgccgtggtg 6060
atccaggaca acagcgacat caaggtggtg ccccgccgca aggccaagat catccgcgac 6120
tacggcaagc agatggccgg cgacgactgc gtggccagcc gccaggacga ggactaggaa 6180
ttcttgctgt gccttctagt tgccagccat ctgttgtttg cccctccccc gtgccttcct 6240
tgaccctgga aggtgccact cccactgtcc tttcctaata aaatgaggaa attgcatcgc 6300
attgtctgag taggtgtcat tctattctgg ggggtggggt ggggcagcac agcaaggggg 6360
aggattggga agacaatagc aggcatgctg gggatgcggt gggctctatg ggtacccagg 6420
tgctgaagaa ttgacccggt tcctcctggg ccagaaagaa gcaggcacat ccccttctct 6480
gtgacacacc ctgtccacgc ccctggttct tagttccagc cccactcata ggacactcat 6540
agctcaggag ggctccgcct tcaatcccac ccgctaaagt acttggagcg gtctctccct 6600
ccctcatcag cccaccaaac caaacctagc ctccaagagt gggaagaaat taaagcaaga 6660
taggctatta agtgcagagg gagagaaaat gcctccaaca tgtgaggaag taatgagaga 6720
aatcatagaa tttcttccgc ttcctcgctc actgactcgc tgcgctcggt cgttcggctg 6780
cggcgagcgg tatcagctca ctcaaaggcg gtaatacggt tatccacaga atcaggggat 6840
aacgcaggaa agaacatgtg agcaaaaggc cagcaaaagg ccaggaaccg taaaaaggcc 6900
gcgttgctgg cgtttttcca taggctccgc cccctgacg agcatcacaa aaatcgacgc 6960
tcaagtcaga ggtggcgaaa cccgacagga ctataaagat accaggcgtt tccccctgga 7020
agctccctcg tgcgctctcc tgttccgacc ctgccgctta ccggatacct gtccgccttt 7080
ctcccttcgg gaagcgtggc gctttctcaa tgctcacgct gtaggtatct cagttcggtg 7140
taggtcgttc gctccaagct gggctgtgtg cacgaacccc ccgttcagcc cgaccgctgc 7200
gccttatccg gtaactatcg tcttgagtcc aacccggtaa gacacgactt atcgccactg 7260
gcagcagcca ctggtaacag gattagcaga gcgaggtatg taggcggtgc tacagagttc 7320
ttgaagtggt ggcctaacta cggctacact agaaggacag tatttggtat ctgcgctctg 7380
ctgaagccag ttaccttcgg aaaaagagtt ggtagctctt gatccggcaa acaaaccacc 7440
gctggtagcg gtggtttttt tgtttgcaag cagcagatta cgcgcagaaa aaaaggatct 7500
caagaagatc ctttgatctt ttctacgggg tctgacgctc agtggaacga aaactcacgt 7560
taagggattt tggtcatgag attatcaaaa aggatcttca cctagatcct tttaaattaa 7620
aaatgaagtt ttaaatcaat ctaaagtata tatgagtaaa cttggtctga cagttaccaa 7680
tgcttaatca gtgaggcacc tatctcagcg atctgtctat ttcgttcatc catagttgcc 7740
tgactccggg gggggggggc gctgaggtct gcctcgtgaa gaaggtgttg ctgactcata 7800
ccaggcctga atcgccccat catccagcca gaaagtgagg gagccacggt tgatgagagc 7860
tttgttgtag gtggaccagt tggtgatttt gaacttttgc tttgccacgg aacggtctgc 7920
gttgtcggga agatgcgtga tctgatcctt caactcagca aaagttcgat ttattcaaca 7980
aagccgccgt cccgtcaagt cagcgtaatg ctctgccagt gttacaacca attaaccaat 8040
tctgattaga aaaactcatc gagcatcaaa tgaaactgca atttattcat atcaggatta 8100
tcaataccat atttttgaaa aagccgtttc tgtaatgaag gagaaaactc accgaggcag 8160
ttccatagga tggcaagatc ctggtatcgg tctgcgattc cgactcgtcc aacatcaata 8220
caacctatta atttcccctc gtcaaaaata aggttatcaa gtgagaaatc accatgagtg 8280

acgactgaat ccggtgagaa tggcaaaagc ttatgcattt ctttccagac ttgttcaaca 8340
ggccagccat tacgctcgtc atcaaaatca ctcgcatcaa ccaaaccgtt attcattcgt 8400
gattgcgcct gagcgagacg aaatacgcga tcgctgttaa aaggacaatt acaaacagga 8460
atcgaatgca accggcgcag gaacactgcc agcgcatcaa caatattttc acctgaatca 8520
ggatattctt ctaatacctg gaatgctgtt ttcccgggga tcgcagtggt gagtaaccat 8580
gcatcatcag gagtacggat aaaatgcttg atggtcggaa gaggcataaa ttccgtcagc 8640
cagtttagtc tgaccatctc atctgtaaca tcattggcaa cgctaccttt gccatgtttc 8700
agaaacaact ctggcgcatc gggcttccca tacaatcgat agattgtcgc acctgattgc 8760
ccgacattat cgcgagccca tttataccca tataaatcag catccatgtt ggaatttaat 8820
cgcggcctcg agcaagacgt ttcccgttga atatggctca taacacccct tgtattactg 8880
tttatgtaag cagacagttt tattgttcat gatgatatat ttttatcttg tgcaatgtaa 8940
catcagagat tttgagacac aacgtggctt tcccccccc cccattattg aagcatttat 9000
cagggttatt gtctcatgag cggatacata tttgaatgta tttagaaaaa taaacaaata 9060
ggggttccgc gcacatttcc ccgaaaagtg ccacctgacg tctaagaaac cattattatc 9120
atgacattaa cctataaaaa taggcgtatc acgaggccct ttcgtc 9166

<210> 169
<211> 9169
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 169
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680

gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcaagttcga 1920
cgcctgggag aagatccgcc tgcgccccgg cggcaagaag aagtaccgca tgaagcacct 1980
gatctgggcc agccgcgagc tggaccgctt cgccctgaac cccagcctgc tggagaccgc 2040
cgacggctgc cagcagatca tggagaagct gcagcccgcc ctgaagaccg gcaccgagga 2100
gatcaagagc ctgttcaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgacgt 2160
gaaggacacc aaggaggccc tggacaagat cgaggagatc aagaacaaga gcaagcagaa 2220
gacccagcag gccgccgccg acaccggcaa cagcagcaac gtgagccaga actaccccat 2280
cgtgcagaac gcccagggcc agatgatcca ccagagcctg agcccccgca ccctgaacgc 2340
ctgggtgaag gtgatcgagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacatgatg ctgaacatcg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggacac catcaacgag gaggccgccg agtgggaccg 2520
cctgcacccc gtgcacgccg gccccatccc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcacccccca ggagcagatc ggctggatga ccggcaaccc 2640
ccccatcccc gtgggcgaca tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccgtga gcatcctgga catcaagcag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct tcaagacctt ccgcgccgag caggccaccc aggacgtgaa 2820
gaactggatg accgacaccc tgctggtgca gaacgccaac cccgactgca aggccatcct 2880
gcgcgccctg ggccccggcg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtgc agcacaccaa 3000
catcatgatg cagcgcggca acttcaaggg ccagaagcgc atcaagtgct tcaactgcgg 3060
caaggagggc cacctggccc gcaactgccg cgccctgcgc aagaagggct gctggaagtg 3120
cggcaaggag ggccaccaga tgaaggactg caccgagcga caggctaatt ttttagggaa 3180
gatctggcct tcccacaagg gaaggccagg gaatttttct cagagcagac cagagccaac 3240
agccccacca gaagagagct tcaggtttgg ggaagagaca acaactcccc ctcagaagca 3300
ggagccgata gacaaggaac tgtatccttt agcttccctc agatcactct ttggcagcga 3360
cccctcgtca caataaagat aggggccag ctgaaggagg cccttctaga caccggcgcc 3420
gacgacaccg tgctggagga gatgaacctg cccggccgct ggaagcccaa gatgatcggc 3480
ggcatcggcg gcttcatcaa ggtgggccag tacgaccaga tcctgatcga gatctgcggc 3540
cacaaggcca tcggcaccgt gctggtgggc cccacccccg tgaacatcat cggccgcaac 3600
ctgctgaccc agatcggctg caccctgaac ttccccatca gccccatcga gaccgtgccc 3660
gtgaagctga agcccggcat ggacggcccc aaggtgaagc agtggcccct gaccgaggag 3720
aagatcaagg ccctggtgga gatctgcacc gagatggaga aggagggcaa gatcagcaag 3780
atcggccccg agaaccccta caacaccccc gtgttcgcca tcaagaagaa ggacagcacc 3840
aagtggcgca agctggtgga cttccgcgag ctgaacaagc gcacccagga cttctgggag 3900
gtgcagctgg gcatccccca ccccgccggc ctgaagcaga agaagagcgt gaccgtgctg 3960
gacgtgggcg acgcctactt cagcgtgccc ctggacaagg acttccgcaa gtacaccgcc 4020
ttcaccatcc ccagcatcaa caacgagacc cccggcatcc gctaccagta caacgtgctg 4080
ccccagggct ggaagggcag ccccgccatc ttccagtgca gcatgaccaa gatcctggag 4140
cccttccgca agcagaaccc cgacatcgtg atctaccagt acatggacca cctgtacgtg 4200
ggcagcgacc tggagatcgg ccagcaccgc accaagatcg aggagctgcg ccagcacctg 4260
ctgcgctggg gcttcaccac ccccgacaag aagcaccaga aggagccccc cttcctgtgg 4320
atgggctacg agctgcaccc cgacaagtgg accgtgcagc ccatcgtgct gcccgagaag 4380
gacagctgga ccgtgaacga catccagaag ctggtgggca agctgaactg ggccagccag 4440
atctacgccg gcatcaaggt gcgccagctg tgcaagctgc tgcgcggcac caaggccctg 4500
accgaggtgg tgcccctgac cgaggaggcc gagctggagc tggccgagaa ccgcgagatc 4560
ctgaaggagc ccgtgcacgg cgtgtactac gaccccagca aggacctgat cgccgagatc 4620
cagaagcagg gccagggcca gtggacctac cagatctacc aggagccctt caagaacctg 4680
aagaccggca agtacgcccg catgaagggc gcccacacca acgacgtgaa gcagctgacc 4740
gaggccgtgc agaagatcgc caccgagagc atcgtgatct ggggcaagac ccccaagttc 4800
aagctgccca tccagaagga gacctgggag gcctggtgga ccgagtactg gcaggccacc 4860
tggatccccg agtgggagtt cgtgaacacc ccccccctgg tgaagctgtg gtaccagctg 4920
gagaaggagc ccatcatcgg cgccgagacc ttctacgtgg acggcgccgc caaccgcgag 4980

accaagctgg gcaaggccgg ctacgtgacc gaccgcggcc gccagaaggt ggtgcccctg 5040
accgacacca ccaaccagaa gaccgagctg caggccatcc acctggccct gcaggacagc 5100
ggcctggagg tgaacatcgt gaccgacagc cagtacgccc tgggcatcat ccaggcccag 5160
cccgacaaga gcgagagcga gctggtgagc cagatcatcg agcagctgat caagaaggag 5220
aaggtgtacc tggcctgggt gcccgcccac aagggcatcg gcggcaacga gcaggtggac 5280
ggcctggtga gcgccggcat ccgcaaggtg ctgttcctgg acggcatcga caaggcccag 5340
gaggagcacg agaagtacca cagcaactgg cgcgccatgg ccagcgactt caacctgccc 5400
cccgtggtgg ccaaggagat cgtggccagc tgcgacaagt gccagctgaa gggcgaggcc 5460
atgcacggcc aggtggactg cagccccggc atctggcagc tggcatgcac ccacctggag 5520
ggcaaggtga tcctggtggc cgtgcacgtg gccagcggct acatcgaggc cgaggtgatc 5580
cccgccgaga ccggccagga gaccgcctac ttcctgctga agctggccgg ccgctggccc 5640
gtgaagaccg tgcacaccga caacggcagc aacttcacca gcaccaccgt gaaggccgcc 5700
tgctggtggg ccggcatcaa gcaggagttc ggcatccccc acaaccccca gagccagggc 5760
gtgatcgaga gcatgaacaa ggagctgaag aagatcatcg gccaggtgcg cgaccaggcc 5820
gagcacctga agaccgccgt gcagatggcc gtgttcatcc acaacttcaa gcgcaagggc 5880
ggcatcggcg gctacagcgc cggcgagcgc atcgtggaca tcatcgccac cgacatccag 5940
accaaggagc tgcagaagca gatcaccaag atccagaact tccgcgtgta ctaccgcgac 6000
agccgcgacc ccgtgtggaa gggccccgcc aagctgctgt ggaagggcga gggcgccgtg 6060
gtgatccagg acaacagcga catcaaggtg gtgccccgcc gcaaggccaa gatcatccgc 6120
gactacggca agcagatggc cggcgacgac tgcgtggcca gccgccagga cgaggactag 6180
gaattcttgc tgtgccttct agttgccagc catctgttgt ttgcccctcc cccgtgcctt 6240
ccttgaccct ggaaggtgcc actcccactg tcctttccta ataaaatgag gaaattgcat 6300
cgcattgtct gagtaggtgt cattctattc tgggggggtgg ggtggggcag cacagcaagg 6360
gggaggattg ggaagacaat agcaggcatg ctggggatgc ggtgggctct atgggtaccc 6420
aggtgctgaa gaattgaccc ggttcctcct gggccagaaa gaagcaggca catccccttc 6480
tctgtgacac accctgtcca cgcccctggt tcttagttcc agccccactc ataggacact 6540
catagctcag gagggctccg ccttcaatcc cacccgctaa agtacttgga gcggtctctc 6600
cctccctcat cagcccacca aaccaaacct agcctccaag agtgggaaga aattaaagca 6660
agataggcta ttaagtgcag agggagagaa aatgcctcca acatgtgagg aagtaatgag 6720
agaaatcata gaatttcttc cgcttcctcg ctcactgact cgctgcgctc ggtcgttcgg 6780
ctgcggcgag cggtatcagc tcactcaaag gcggtaatac ggttatccac agaatcaggg 6840
gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa aggccaggaa ccgtaaaaag 6900
gccgcgttgc tggcgttttt ccataggctc cgccccctg acgagcatca caaaaatcga 6960
cgctcaagtc agaggtggcg aaacccgaca ggactataaa gataccaggc gtttcccct 7020
ggaagctccc tcgtgcgctc tcctgttccg accctgccgc ttaccggata cctgtccgcc 7080
tttctccctt cgggaagcgt ggcgctttct caatgctcac gctgtaggta tctcagttcg 7140
gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac ccccgttca gcccgaccgc 7200
tgcgccttat ccggtaacta tcgtcttgag tccaacccgg taagacacga cttatcgcca 7260
ctggcagcag ccactggtaa caggattagc agagcgaggt atgtaggcgg tgctacagag 7320
ttcttgaagt ggtggcctaa ctacggctac actagaagga cagtatttgg tatctgcgct 7380
ctgctgaagc cagttacctt cggaaaaaga gttggtagct cttgatccgg caaacaaacc 7440
accgctggta gcggtggttt ttttgtttgc aagcagcaga ttacgcgcag aaaaaaagga 7500
tctcaagaag atcctttgat cttttctacg gggtctgacg ctcagtggaa cgaaaactca 7560
cgttaaggga ttttggtcat gagattatca aaaaggatct tcacctagat ccttttaaat 7620
taaaaatgaa gttttaaatc aatctaaagt atatatgagt aaacttggtc tgacagttac 7680
caatgcttaa tcagtgaggc acctatctca gcgatctgtc tatttcgttc atccatagtt 7740
gcctgactcc gggggggggg ggcgctgagg tctgcctcgt gaagaaggtg ttgctgactc 7800
ataccaggcc tgaatcgccc catcatccag ccagaaagtg agggagccac ggttgatgag 7860
agctttgttg taggtggacc agttggtgat tttgaacttt tgctttgcca cggaacggtc 7920
tgcgttgtcg ggaagatgcg tgatctgatc cttcaactca gcaaaagttc gatttattca 7980
acaaagccgc cgtcccgtca agtcagcgta atgctctgcc agtgttacaa ccaattaacc 8040
aattctgatt agaaaaactc atcgagcatc aaatgaaact gcaatttatt catatcagga 8100
ttatcaatac catatttttg aaaaagccgt ttctgtaatg aaggagaaaa ctcaccgagg 8160
cagttccata ggatggcaag atcctggtat cggtctgcga ttccgactcg tccaacatca 8220
atacaaccta ttaatttccc ctcgtcaaaa ataaggttat caagtgagaa atcaccatga 8280

gtgacgactg aatccggtga gaatggcaaa agcttatgca tttctttcca gacttgttca 8340
acaggccagc cattacgctc gtcatcaaaa tcactcgcat caaccaaacc gttattcatt 8400
cgtgattgcg cctgagcgag acgaaatacg cgatcgctgt taaaaggaca attacaaaca 8460
ggaatcgaat gcaaccggcg caggaacact gccagcgcat caacaatatt ttcacctgaa 8520
tcaggatatt cttctaatac ctggaatgct gttttcccgg ggatcgcagt ggtgagtaac 8580
catgcatcat caggagtacg gataaaatgc ttgatggtcg gaagaggcat aaattccgtc 8640
agccagttta gtctgaccat ctcatctgta acatcattgg caacgctacc tttgccatgt 8700
ttcagaaaca actctggcgc atcgggcttc ccatacaatc gatagattgt cgcacctgat 8760
tgcccgacat tatcgcgagc ccatttatac ccatataaat cagcatccat gttggaattt 8820
aatcgcggcc tcgagcaaga cgtttcccgt tgaatatggc tcataacacc ccttgtatta 8880
ctgtttatgt aagcagacag ttttattgtt catgatgata tatttttatc ttgtgcaatg 8940
taacatcaga gattttgaga cacaacgtgg ctttcccccc ccccccatta ttgaagcatt 9000
tatcagggtt attgtctcat gagcggatac atatttgaat gtatttagaa aaataaacaa 9060
ataggggttc cgcgcacatt tccccgaaaa gtgccacctg acgtctaaga aaccattatt 9120
atcatgacat taacctataa aaataggcgt atcacgaggc cctttcgtc 9169

<210> 170
<211> 9792
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 170
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680

gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcgagctgga 1920
ccgctgggag aagatccgcc tgcgccccgg cggcaagaag aagtacaagc tgaagcacat 1980
cgtgtgggcc agccgcgagc tggagcgctt cgccgtgaac cccggcctgc tggagaccag 2040
cgagggctgc cgccagatcc tgggccagct gcagcccagc ctgcagaccg gcagcgagga 2100
gctgcgcagc ctgtacaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgagat 2160
caaggacacc aaggaggccc tggacaagat cgaggaggag cagaacaaga gcaagaagaa 2220
ggcccagcag gccgccgccg acaccggcca cagcaaccag gtgagccaga actaccccat 2280
cgtgcagaac atccagggcc agatggtgca ccaggccatc agcccccgca ccctgaacgc 2340
ctgggtgaag gtggtggagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacaccatg ctgaacaccg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggagac catcaacgag gaggccgccg agtgggaccg 2520
cgtgcacccc gtgcacgccg gccccatcgc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcaccctgca ggagcagatc ggctggatga ccaacaaccc 2640
ccccatcccc gtgggcgaga tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccacca gcatcctgga catccgccag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct acaagaccct gcgcgccgag caggccagcc aggaggtgaa 2820
gaactggatg accgagaccc tgctggtgca gaacgccaac cccgactgca agaccatcct 2880
gaaggccctg ggccccgccg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtga ccaacagcgc 3000
caccatcatg atgcagcgcg gcaacttccg caaccagcgc aagatcgtga agtgcttcaa 3060
ctgcggcaag gagggccaca ccgcccgcaa ctgccgcgcc ccccgcaaga agggctgctg 3120
gaagtgcggc aaggagggcc accagatgaa ggactgcacc gagcgacagg ctaataggga 3180
agatctggcc ttcccacaag ggaaggccag ggaattttct tcagagcaga ccagagccaa 3240
cagccccacc agaagagagc ttcaggtttg gggaagagac aacaactccc tctcagaagc 3300
aggagccgat agacaaggaa ctgtatcctt tagcttcccc cagatcactc tttggcagcg 3360
acccctcgtc acaataaaga taggggcca gctgaaggag gcccttctag acaccggcgc 3420
cgacgacacc gtgctggagg agatgaacct gcccggccgc tggaagccca agatgatcgg 3480
cggcatcggc ggcttcatca aggtgggcca gtacgaccag atcctgatcg agatctgcgg 3540
ccacaaggcc atcggcaccg tgctggtggg ccccaccccc gtgaacatca tcggccgcaa 3600
cctgctgacc cagatcggct gcaccctgaa cttccccatc agccccatcg agaccgtgcc 3660
cgtgaagctg aagcccggca tggacggccc caaggtgaag cagtggcccc tgaccgagga 3720
gaagatcaag gccctggtgg agatctgcac cgagatggag aaggagggca agatcagcaa 3780
gatcggcccc gagaaccccc acaacacccc cgtgttcgcc atcaagaaga aggacagcac 3840
caagtggcgc aagctggtgg acttccgcga gctgaacaag cgcacccagg acttctggga 3900
ggtgcagctg ggcatccccc accccgccgg cctgaagcag aagaagagcg tgaccgtgct 3960
ggacgtgggc gacgcctact tcagcgtgcc cctggacaag gacttccgca agtacaccgc 4020
cttcaccatc cccagcatca acaacgagac ccccggcatc cgctaccagt acaacgtgct 4080
gccccagggc tggaagggca gccccgccat cttccagtgc agcatgacca agatcctgga 4140
gcccttccgc aagcagaacc ccgacatcgt gatctaccag tacatggacc acctgtacgt 4200
gggcagcgac ctggagatcg gccagcaccg caccaagatc gaggagctgc gccagcacct 4260
gctgcgctgg ggcttcacca cccccgacaa gaagcaccag aaggagcccc ccttcctgtg 4320
gatgggctac gagctgcacc ccgacaagtg gaccgtgcag cccatcgtgc tgcccgagaa 4380
ggacagctgg accgtgaacg acatccagaa gctggtgggc aagctgaact gggccagcca 4440
gatctacgcc ggcatcaagg tgcgccagct gtgcaagctg ctgcgcggca ccaaggccct 4500
gaccgaggtg gtgcccctga ccgaggaggc cgagctggag ctggccgaga accgcgagat 4560
cctgaaggag cccgtgcacg gcgtgtacta cgaccccagc aaggacctga tcgccgagat 4620
ccagaagcag ggccagggcc agtggaccta ccagatctac caggagccct tcaagaacct 4680
gaagaccggc aagtacgccc gcatgaaggg cgcccacacc aacgacgtga agcagctgac 4740
cgaggccgtg cagaagatcg ccaccgagag catcgtgatc tggggcaaga cccccaagtt 4800
caagctgccc atccagaagg agacctggga ggcctggtgg accgagtact ggcaggccac 4860
ctggatcccc gagtgggagt tcgtgaacac ccccccctg gtgaagctgt ggtaccagct 4920
ggagaaggag cccatcatcg gcgccgagac cttctacgtg gacggcgccg ccaaccgcga 4980

gaccaagctg ggcaaggccg gctacgtgac cgaccgcggc cgccagaagg tggtgcccct 5040
gaccgacacc accaaccaga agaccgagct gcaggccatc cacctggccc tgcaggacag 5100
cggcctggag gtgaacatcg tgaccgacag ccagtacgcc ctgggcatca tccaggccca 5160
gcccgacaag agcgagagcg agctggtgag ccagatcatc gagcagctga tcaagaagga 5220
gaaggtgtac ctggcctggg tgcccgccca caagggcatc ggcggcaacg agcaggtgga 5280
cggcctggtg agcgccggca tccgcaaggt gctgttcctg gacggcatcg acaaggccca 5340
ggaggagcac gagaagtacc acagcaactg gcgcgccatg gccagcgact tcaacctgcc 5400
ccccgtggtg gccaaggaga tcgtggccag ctgcgacaag tgccagctga agggcgaggc 5460
catgcacggc caggtggact gcagccccgg catctggcag ctggcatgca cccacctgga 5520
gggcaaggtg atcctggtgg ccgtgcacgt ggccagcggc tacatcgagg ccgaggtgat 5580
ccccgccgag accggccagg agaccgccta cttcctgctg aagctggccg gccgctggcc 5640
cgtgaagacc gtgcacaccg acaacggcag caacttcacc agcaccaccg tgaaggccgc 5700
ctgctggtgg gccggcatca agcaggagtt cggcatcccc tacaaccccc agagccaggg 5760
cgtgatcgag agcatgaaca aggagctgaa gaagatcatc ggccaggtgc gcgaccaggc 5820
cgagcacctg aagaccgccg tgcagatggc cgtgttcatc cacaacttca agcgcaaggg 5880
cggcatcggc ggctacagcg ccggcgagcg catcgtggac atcatcgcca ccgacatcca 5940
gaccaaggag ctgcagaagc agatcaccaa gatccagaac ttccgcgtgt actaccgcga 6000
cagccgcgac cccgtgtgga agggcccccgc caagctgctg tggaagggcg agggcgccgt 6060
ggtgatccag gacaacagcg acatcaaggt ggtgccccgc cgcaaggcca agatcatccg 6120
cgactacggc aagcagatgg ccggcgacga ctgcgtggcc agccgccagg acgaggacat 6180
gggcggcaag tggagcaaga gcagcgtgat cggctggccc gccgtgcgcg agcgcatgcg 6240
ccgcgccgag cccgccgccg acggcgtggg cgccgtgagc cgcgacctgg agaagcacgg 6300
cgccatcacc agcagcaaca ccgccgccaa caacgccgcc tgcgcctggc tggaggccca 6360
ggaggaggag gaggtgggct tccccgtgac cccccaggtg cccctgcgcc ccatgaccta 6420
caaggccgcc gtggacctga gccacttcct gaaggagaag ggcggcctgg agggcctgat 6480
ccacagccag cgccgccagg acatcctgga cctgtggatc taccacaccc agggctactt 6540
ccccgactgg cagaactaca ccccccggccc cggcgtgcgc taccccctga ccttcggctg 6600
gtgctacaag ctggtgcccg tggagcccga caaggtggag gaggccaaca agggcgagaa 6660
caccagcctg ctgcaccccg tgagcctgca cggcatggac gaccccgagc gcgaggtgct 6720
ggagtggcgc ttcgacagcc gcctggcctt ccaccacgtg gcccgcgagc tgcaccccga 6780
gtacttcaag aactgctgag gatcaattct tgctgtgcct tctagttgcc agccatctgt 6840
tgtttgcccc tcccccgtgc cttccttgac cctggaaggt gccactccca ctgtcctttc 6900
ctaataaaat gaggaaattg catcgcattg tctgagtagg tgtcattcta ttctgggggg 6960
tggggtgggg cagcacagca aggggggagga ttgggaagac aatagcaggc atgctgggga 7020
tgcggtgggc tctatgggta cccaggtgct gaagaattga cccggttcct cctgggccag 7080
aaagaagcag gcacatcccc ttctctgtga cacaccctgt ccacgccccct ggttcttagt 7140
tccagcccca ctcataggac actcatagct caggagggct ccgccttcaa tcccacccgc 7200
taaagtactt ggagcggtct ctccctccct catcagccca ccaaaccaaa cctagcctcc 7260
aagagtggga agaaattaaa gcaagatagg ctattaagtg cagagggaga gaaaatgcct 7320
ccaacatgtg aggaagtaat gagagaaatc atagaatttc ttccgcttcc tcgctcactg 7380
actcgctgcg ctcggtcgtt cggctgcggc gagcggtatc agctcactca aaggcggtaa 7440
tacggttatc cacagaatca ggggataacg caggaaagaa catgtgagca aaaggccagc 7500
aaaaggccag gaaccgtaaa aaggccgcgt tgctggcgtt tttccatagg ctccgccccc 7560
ctgacgagca tcacaaaaat cgacgctcaa gtcagaggtg gcgaaacccg acaggactat 7620
aaagatacca ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc 7680
cgcttaccgg atacctgtcc gcctttctcc cttcgggaag cgtggcgctt tctcaatgct 7740
cacgctgtag gtatctcagt tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg 7800
aacccccccgt tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc 7860
cggtaagaca cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga 7920
ggtatgtagg cggtgctaca gagttcttga agtggtggcc taactacggc tacactagaa 7980
ggacagtatt tggtatctgc gctctgctga agccagttac cttcggaaaa agagttggta 8040
gctcttgatc cggcaaacaa accaccgctg gtagcggtgg ttttttgtt tgcaagcagc 8100
agattacgcg cagaaaaaaa ggatctcaag aagatccttt gatcttttct acggggtctg 8160
acgctcagtg gaacgaaaac tcacgttaag ggattttggt catgagatta tcaaaaagga 8220
tcttcaccta gatcctttta aattaaaaat gaagttttaa atcaatctaa agtatatatg 8280

agtaaacttg gtctgacagt taccaatgct taatcagtga ggcacctatc tcagcgatct 8340
gtctatttcg ttcatccata gttgcctgac tccgggggggg gggggcgctg aggtctgcct 8400
cgtgaagaag gtgttgctga ctcataccag gcctgaatcg ccccatcatc cagccagaaa 8460
gtgagggagc cacggttgat gagagctttg ttgtaggtgg accagttggt gattttgaac 8520
ttttgctttg ccacggaacg gtctgcgttg tcgggaagat gcgtgatctg atccttcaac 8580
tcagcaaaag ttcgatttat tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct 8640
gccagtgtta caaccaatta accaattctg attagaaaaa ctcatcgagc atcaaatgaa 8700
actgcaattt attcatatca ggattatcaa taccatattt ttgaaaaagc cgtttctgta 8760
atgaaggaga aaactcaccg aggcagttcc ataggatggc aagatcctgg tatcggtctg 8820
cgattccgac tcgtccaaca tcaatacaac ctattaattt cccctcgtca aaaataaggt 8880
tatcaagtga gaaatcacca tgagtgacga ctgaatccgg tgagaatggc aaaagcttat 8940
gcatttcttt ccagacttgt tcaacaggcc agccattacg ctcgtcatca aaatcactcg 9000
catcaaccaa accgttattc attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc 9060
tgttaaaagg acaattacaa acaggaatcg aatgcaaccg gcgcaggaac actgccagcg 9120
catcaacaat attttcacct gaatcaggat attcttctaa tacctggaat gctgttttcc 9180
cggggatcgc agtggtgagt aaccatgcat catcaggagt acggataaaa tgcttgatgg 9240
tcggaagagg cataaattcc gtcagccagt ttagtctgac catctcatct gtaacatcat 9300
tggcaacgct acctttgcca tgtttcagaa acaactctgg cgcatcgggc ttcccataca 9360
atcgatagat tgtcgcacct gattgcccga cattatcgcg agcccattta tacccatata 9420
aatcagcatc catgttggaa tttaatcgcg gcctcgagca agacgtttcc cgttgaatat 9480
ggctcataac accccttgta ttactgttta tgtaagcaga cagttttatt gttcatgatg 9540
atatattttt atcttgtgca atgtaacatc agagattttg agacacaacg tggctttccc 9600
cccccccca ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg 9660
aatgtattta gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac 9720
ctgacgtcta agaaaccatt attatcatga cattaaccta taaaaatagg cgtatcacga 9780
ggccctttcg tc 9792

<210> 171
<211> 9167
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 171
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020

tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tggcccgcgc cagcgtgctg agcggcggcg agctggaccg 1920
ctgggagaag atccgcctgc gccccggcgg caagaagaag tacaagctga agcacatcgt 1980
gtgggccagc cgcgagctgg agcgcttcgc cgtgaacccc ggcctgctgg agaccagcga 2040
gggctgccgc cagatcctgg gccagctgca gcccagcctg cagaccggca gcgaggagct 2100
gcgcagcctg tacaacaccg tggccaccct gtactgcgtg caccagcgca tcgagatcaa 2160
ggacaccaag gaggccctgg acaagatcga ggaggagcag aacaagagca agaagaaggc 2220
ccagcaggcc gccgccgaca ccggccacag caaccaggtg agccagaact accccatcgt 2280
gcagaacatc cagggccaga tggtgcacca ggccatcagc ccccgcaccc tgaacgcctg 2340
ggtgaaggtg gtggaggaga aggccttcag ccccgaggtg atccccatgt tcagcgccct 2400
gagcgagggc gccacccccc aggacctgaa caccatgctg aacaccgtgg gcggccacca 2460
ggccgccatg cagatgctga aggagaccat caacgaggag gccgccgagt gggaccgcgt 2520
gcaccccgtg cacgccggcc ccatcgcccc cggccagatg cgcgagcccc gcggcagcga 2580
catcgccggc accaccagca ccctgcagga gcagatcggc tggatgacca acaacccccc 2640
catccccgtg ggcgagatct acaagcgctg gatcatcctg ggcctgaaca agatcgtgcg 2700
catgtacagc cccaccagca tcctggacat ccgccagggc cccaaggagc ccttccgcga 2760
ctacgtggac cgcttctaca agaccctgcg cgccgagcag gccagccagg aggtgaagaa 2820
ctggatgacc gagaccctgc tggtgcagaa cgccaacccc gactgcaaga ccatcctgaa 2880
ggccctgggc cccgccgcca ccctggagga gatgatgacc gcctgccagg gcgtgggcgg 2940
ccccggccac aaggcccgcg tgctggccga ggccatgagc caggtgacca acagcgccac 3000
catcatgatg cagcgcggca acttccgcaa ccagcgcaag atcgtgaagt gcttcaactg 3060
cggcaaggag ggccacaccg cccgcaactg ccgcgccccc cgcaagaagg gctgctggaa 3120
gtgcggcaag gagggccacc agatgaagga ctgcaccgag cgacaggcta atagggaaga 3180
tctggccttc ccacaaggga aggccaggga attttcttca gagcagacca gagccaacag 3240
ccccaccaga agagagcttc aggtttgggg aagagacaac aactccctct cagaagcagg 3300
agccgataga caaggaactg tatcctttag cttccctcag atcactcttt ggcagcgacc 3360
cctcgtcaca ataaagatag ggggccagct gaaggaggcc cttctagaca ccggcgccga 3420
cgacaccgtg ctggaggaga tgaacctgcc cggccgctgg aagcccaaga tgatcggcgg 3480
catcggcggc ttcatcaagg tgggccagta cgaccagatc ctgatcgaga tctgcggcca 3540
caaggccatc ggcaccgtgc tggtgggccc caccccctgtg aacatcatcg gccgcaacct 3600
gctgacccag atcggctgca ccctgaactt ccccatcagc cccatcgaga ccgtgcccgt 3660
gaagctgaag cccggcatgg acggccccaa ggtgaagcag tggcccctga ccgaggagaa 3720
gatcaaggcc ctggtggaga tctgcaccga gatggagaag gagggcaaga tcagcaagat 3780
cggccccgag aacccctaca acaccccccgt gttcgccatc aagaagaagg acagcaccaa 3840
gtggcgcaag ctggtggact tccgcgagct gaacaagcgc acccaggact tctgggaggt 3900
gcagctgggc atcccccacc ccgccggcct gaagcagaag aagagcgtga ccgtgctgga 3960
cgtgggcgac gcctacttca gcgtgcccct ggacaaggac ttccgcaagt acaccgcctt 4020
caccatcccc agcatcaaca acgagacccc cggcatccgc taccagtaca acgtgctgcc 4080
ccagggctgg aagggcagcc ccgccatctt ccagtgcagc atgaccaaga tcctggagcc 4140
cttccgcaag cagaaccccg acatcgtgat ctaccagtac atggaccacc tgtacgtggg 4200
cagcgacctg gagatcggcc agcaccgcac caagatcgag gagctgcgcc agcacctgct 4260
gcgctggggc ttcaccaccc ccgacaagaa gcaccagaag gagccccccct tcctgtggat 4320

gggctacgag ctgcaccccg acaagtggac cgtgcagccc atcgtgctgc ccgagaagga 4380
cagctggacc gtgaacgaca tccagaagct ggtgggcaag ctgaactggg ccagccagat 4440
ctacgccggc atcaaggtgc gccagctgtg caagctgctg cgcggcacca aggccctgac 4500
cgaggtggtg cccctgaccg aggaggccga gctggagctg gccgagaacc gcgagatcct 4560
gaaggagccc gtgcacggcg tgtactacga ccccagcaag gacctgatcg ccgagatcca 4620
gaagcagggc cagggccagt ggacctacca gatctaccag gagcccttca agaacctgaa 4680
gaccggcaag tacgcccgca tgaagggcgc ccacaccaac gacgtgaagc agctgaccga 4740
ggccgtgcag aagatcgcca ccgagagcat cgtgatctgg ggcaagaccc ccaagttcaa 4800
gctgcccatc cagaaggaga cctgggaggc ctggtggacc gagtactggc aggccacctg 4860
gatccccgag tgggagttcg tgaacacccc ccccctggtg aagctgtggt accagctgga 4920
gaaggagccc atcatcggcg ccgagacctt ctacgtggac ggcgccgcca accgcgagac 4980
caagctgggc aaggccggct acgtgaccga ccgcggccgc cagaaggtgg tgcccctgac 5040
cgacaccacc aaccagaaga ccgagctgca ggccatccac ctggccctgc aggacagcgg 5100
cctggaggtg aacatcgtga ccgacagcca gtacgccctg ggcatcatcc aggcccagcc 5160
cgacaagagc gagagcgagc tggtgagcca gatcatcgag cagctgatca agaaggagaa 5220
ggtgtacctg gcctgggtgc ccgcccacaa gggcatcggc ggcaacgagc aggtggacgg 5280
cctggtgagc gccggcatcc gcaaggtgct gttcctggac ggcatcgaca aggcccagga 5340
ggagcacgag aagtaccaca gcaactggcg cgccatggcc agcgacttca acctgccccc 5400
cgtggtggcc aaggagatcg tggccagctg cgacaagtgc cagctgaagg gcgaggccat 5460
gcacggccag gtggactgca gccccggcat ctggcagctg gcatgcaccc acctggaggg 5520
caaggtgatc ctggtggccg tgcacgtggc cagcggctac atcgaggccg aggtgatccc 5580
cgccgagacc ggccaggaga ccgcctactt cctgctgaag ctggccggcc gctggcccgt 5640
gaagaccgtg cacaccgaca acggcagcaa cttcaccagc accaccgtga aggccgcctg 5700
ctggtgggcc ggcatcaagc aggagttcgg catcccctac aacccccaga gccagggcgt 5760
gatcgagagc atgaacaagg agctgaagaa gatcatcggc caggtgcgcg accaggccga 5820
gcacctgaag accgccgtgc agatggccgt gttcatccac aacttcaagc gcaagggcgg 5880
catcggcggc tacagcgccg gcgagcgcat cgtggacatc atcgccaccg acatccagac 5940
caaggagctg cagaagcaga tcaccaagat ccagaacttc cgcgtgtact accgcgacag 6000
ccgcgacccc gtgtggaagg gccccgccaa gctgctgtgg aagggcgagg gcgccgtggt 6060
gatccaggac aacagcgaca tcaaggtggt gccccgccgc aaggccaaga tcatccgcga 6120
ctacggcaag cagatggccg gcgacgactg cgtggccagc cgccaggacg aggactagga 6180
attcttgctg tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc 6240
ttgaccctgg aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg 6300
cattgtctga gtaggtgtca ttctattctg gggggtgggg tggggcagca cagcaagggg 6360
gaggattggg aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag 6420
gtgctgaaga attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc 6480
tgtgacacac cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca 6540
tagctcagga gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc 6600
tccctcatca gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag 6660
ataggctatt aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag 6720
aaatcataga atttcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 6780
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 6840
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 6900
cgcgttgctg gcgtttttcc ataggctccg cccccctgac gagcatcaca aaaatcgacg 6960
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 7020
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 7080
tctcccttcg ggaagcgtgg cgctttctca atgctcacgc tgtaggtatc tcagttcggt 7140
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 7200
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 7260
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 7320
cttgaagtgg tggcctaact acggctacac tagaaggaca gtatttggta tctgcgctct 7380
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 7440
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 7500
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 7560
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 7620

aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 7680
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 7740
ctgactccgg gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat 7800
accaggcctg aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag 7860
ctttgttgta ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg 7920
cgttgtcggg aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac 7980
aaagccgccg tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa 8040
ttctgattag aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt 8100
atcaatacca tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca 8160
gttccatagg atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat 8220
acaacctatt aatttccect cgtcaaaaat aaggttatca agtgagaaat caccatgagt 8280
gacgactgaa tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac 8340
aggccagcca ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg 8400
tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg 8460
aatcgaatgc aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc 8520
aggatattct tctaatacct ggaatgctgt tttcccgggg atcgcagtgg tgagtaacca 8580
tgcatcatca ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag 8640
ccagtttagt ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt 8700
cagaaacaac tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg 8760
cccgacatta tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa 8820
tcgcggcctc gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact 8880
gtttatgtaa gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta 8940
acatcagaga ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta 9000
tcagggttat tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat 9060
aggggttccg cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat 9120
catgacatta acctataaaa ataggcgtat cacgaggccc tttcgtc 9167

<210> 172
<211> 9783
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 172
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020

tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tggcccgcgc cagcgtgctg agcggcggcg agctggaccg 1920
ctgggagaag atccgcctgc gccccggcgg caagaagaag tacaagctga agcacatcgt 1980
gtgggccagc cgcgagctgg agcgcttcgc cgtgaacccc ggcctgctgg agaccagcga 2040
gggctgccgc cagatcctgg gccagctgca gcccagcctg cagaccggca gcgaggagct 2100
gcgcagcctg tacaacaccg tggccaccct gtactgcgtg caccagcgca tcgagatcaa 2160
ggacaccaag gaggccctgg acaagatcga ggaggagcag aacaagagca agaagaaggc 2220
ccagcaggcc gccgccgaca ccggccacag caaccaggtg agccagaact accccatcgt 2280
gcagaacatc cagggccaga tggtgcacca ggccatcagc ccccgcaccc tgaacgcctg 2340
ggtgaaggtg gtggaggaga aggccttcag ccccgaggtg atccccatgt tcagcgccct 2400
gagcgagggc gccacccccc aggacctgaa caccatgctg aacaccgtgg gcggccacca 2460
ggccgccatg cagatgctga aggagaccat caacgaggag gccgccgagt gggaccgcgt 2520
gcaccccgtg cacgccggcc ccatcgcccc cggccagatg cgcgagcccc gcggcagcga 2580
catcgccggc accaccagca ccctgcagga gcagatcggc tggatgacca acaacccccc 2640
catccccgtg ggcgagatct acaagcgctg gatcatcctg ggcctgaaca agatcgtgcg 2700
catgtacagc cccaccagca tcctggacat ccgccagggc cccaaggagc ccttccgcga 2760
ctacgtggac cgcttctaca agaccctgcg cgccgagcag gccagccagg aggtgaagaa 2820
ctggatgacc gagaccctgc tggtgcagaa cgccaacccc gactgcaaga ccatcctgaa 2880
ggccctgggc cccgccgcca ccctggagga gatgatgacc gcctgccagg gcgtgggcgg 2940
ccccggccac aaggcccgcg tgctggccga ggccatgagc caggtgacca acagcgccac 3000
catcatgatg cagcgcggca acttccgcaa ccagcgcaag atcgtgaagt gcttcaactg 3060
cggcaaggag ggccacaccg cccgcaactg ccgcgccccc cgcaagaagg gctgctggaa 3120
gtgcggcaag gagggccacc agatgaagga ctgcaccgag cgacaggcta atagggaaga 3180
tctggccttc ccacaaggga aggccaggga attttcttca gagcagacca gagccaacag 3240
ccccaccaga agagagcttc aggtttgggg aagagacaac aactccctct cagaagcagg 3300
agccgataga caaggaactg tatcctttag cttccctcag atcactcttt ggcagcgacc 3360
cctcgtcaca ataaagatag ggggccagct gaaggaggcc cttctagaca ccggcgccga 3420
cgacaccgtg ctggaggaga tgaacctgcc cggccgctgg aagcccaaga tgatcggcgg 3480
catcggcggc ttcatcaagg tgggccagta cgaccagatc ctgatcgaga tctgcggcca 3540
caaggccatc ggcaccgtgc tggtgggccc caccccctgtg aacatcatcg gccgcaacct 3600
gctgacccag atcggctgca ccctgaactt ccccatcagc cccatcgaga ccgtgcccgt 3660
gaagctgaag cccggcatgg acggccccaa ggtgaagcag tggcccctga ccgaggagaa 3720
gatcaaggcc ctggtggaga tctgcaccga gatggagaag gagggcaaga tcagcaagat 3780
cggccccgag aacccctaca acaccccccgt gttcgccatc aagaagaagg acagcaccaa 3840
gtggcgcaag ctggtggact tccgcgagct gaacaagcgc acccaggact tctgggaggt 3900
gcagctgggc atcccccacc ccgccggcct gaagcagaag aagagcgtga ccgtgctgga 3960
cgtgggcgac gcctacttca gcgtgccct ggacaaggac ttccgcaagt acaccgcctt 4020
caccatcccc agcatcaaca acgagacccc cggcatccgc taccagtaca acgtgctgcc 4080
ccagggctgg aagggcagcc ccgccatctt ccagtgcagc atgaccaaga tcctggagcc 4140
cttccgcaag cagaaccccg acatcgtgat ctaccagtac atggaccacc tgtacgtggg 4200
cagcgacctg gagatcggcc agcaccgcac caagatcgag gagctgcgcc agcacctgct 4260
gcgctggggc ttcaccaccc ccgacaagaa gcaccagaag gagccccct tcctgtggat 4320

gggctacgag ctgcaccccg acaagtggac cgtgcagccc atcgtgctgc ccgagaagga 4380
cagctggacc gtgaacgaca tccagaagct ggtgggcaag ctgaactggg ccagccagat 4440
ctacgccggc atcaaggtgc gccagctgtg caagctgctg cgcggcacca aggccctgac 4500
cgaggtggtg cccctgaccg aggaggccga gctggagctg gccgagaacc gcgagatcct 4560
gaaggagccc gtgcacggcg tgtactacga ccccagcaag gacctgatcg ccgagatcca 4620
gaagcagggc cagggccagt ggacctacca gatctaccag gagcccttca agaacctgaa 4680
gaccggcaag tacgcccgca tgaagggcgc ccacaccaac gacgtgaagc agctgaccga 4740
ggccgtgcag aagatcgcca ccgagagcat cgtgatctgg ggcaagaccc ccaagttcaa 4800
gctgcccatc cagaaggaga cctgggaggc ctggtggacc gagtactggc aggccacctg 4860
gatccccgag tgggagttcg tgaacacccc ccccctggtg aagctgtggt accagctgga 4920
gaaggagccc atcatcggcg ccgagacctt ctacgtggac ggcgccgcca accgcgagac 4980
caagctgggc aaggccggct acgtgaccga ccgcggccgc cagaaggtgg tgcccctgac 5040
cgacaccacc aaccagaaga ccgagctgca ggccatccac ctggccctgc aggacagcgg 5100
cctggaggtg aacatcgtga ccgacagcca gtacgccctg ggcatcatcc aggcccagcc 5160
cgacaagagc gagagcgagc tggtgagcca gatcatcgag cagctgatca agaaggagaa 5220
ggtgtacctg gcctgggtgc ccgcccacaa gggcatcggc ggcaacgagc aggtggacgg 5280
cctggtgagc gccggcatcc gcaaggtgct gttcctggac ggcatcgaca aggcccagga 5340
ggagcacgag aagtaccaca gcaactggcg cgccatggcc agcgacttca acctgccccc 5400
cgtggtggcc aaggagatcg tggccagctg cgacaagtgc cagctgaagg gcgaggccat 5460
gcacggccag gtggactgca gccccggcat ctggcagctg gcatgcaccc acctggaggg 5520
caaggtgatc ctggtggccg tgcacgtggc cagcggctac atcgaggccg aggtgatccc 5580
cgccgagacc ggccaggaga ccgcctactt cctgctgaag ctggccggcc gctggcccgt 5640
gaagaccgtg cacaccgaca acggcagcaa cttcaccagc accaccgtga aggccgcctg 5700
ctggtgggcc ggcatcaagc aggagttcgg catcccctac aaccccaga gccagggcgt 5760
gatcgagagc atgaacaagg agctgaagaa gatcatcggc caggtgcgcg accaggccga 5820
gcacctgaag accgccgtgc agatggccgt gttcatccac aacttcaagc gcaagggcgg 5880
catcggcggc tacagcgccg gcgagcgcat cgtggacatc atcgccaccg acatccagac 5940
caaggagctg cagaagcaga tcaccaagat ccagaacttc cgcgtgtact accgcgacag 6000
ccgcgacccc gtgtggaagg gccccgccaa gctgctgtgg aagggcgagg gcgccgtggt 6060
gatccaggac aacagcgaca tcaaggtggt gccccgccgc aaggccaaga tcatccgcga 6120
ctacggcaag cagatggccg gcgacgactg cgtggccagc cgccaggacg aggacatggg 6180
cggcaagtgg agcaagagca gcgtgatcgg ctggcccgcc gtgcgcgagc gcatgcgccg 6240
cgccgagccc gccgccgacg gcgtgggcgc cgtgagccgc gacctggaga agcacggcgc 6300
catcaccagc agcaacaccg ccgccaacaa cgccgcctgc gcctggctgg aggcccagga 6360
ggaggaggag gtgggcttcc ccgtgacccc ccaggtgccc ctgcgcccca tgacctacaa 6420
ggccgccgtg gacctgagcc acttcctgaa ggagaagggc ggcctggagg gcctgatcca 6480
cagccagcgc cgccaggaca tcctggacct gtggatctac cacacccagg gctacttccc 6540
cgactggcag aactacaccc ccggccccgg cgtgcgctac cccctgacct tcggctggtg 6600
ctacaagctg gtgcccgtgg agcccgacaa ggtggaggag gccaacaagg gcgagaacac 6660
cagcctgctg caccccgtga gcctgcacgg catggacgac cccgagcgcg aggtgctgga 6720
gtggcgcttc gacagccgcc tggccttcca ccacgtggcc cgcgagctgc accccgagta 6780
cttcaagaac tgctgaggat caattcttgc tgtgccttct agttgccagc catctgttgt 6840
ttgcccctcc cccgtgcctt ccttgaccct ggaaggtgcc actcccactg tcctttccta 6900
ataaaatgag gaaattgcat cgcattgtct gagtaggtgt cattctattc tgggggggtgg 6960
ggtggggcag cacagcaagg gggaggattg ggaagacaat agcaggcatg ctggggatgc 7020
ggtgggctct atgggtaccc aggtgctgaa gaattgaccc ggttcctcct gggccagaaa 7080
gaagcaggca catccccttc tctgtgacac accctgtcca cgcccctggt tcttagttcc 7140
agccccactc ataggacact catagctcag gagggctccg ccttcaatcc cacccgctaa 7200
agtacttgga gcggtctctc cctccctcat cagcccacca aaccaaacct agcctccaag 7260
agtgggaaga aattaaagca agataggcta ttaagtgcag agggagagaa aatgcctcca 7320
acatgtgagg aagtaatgag agaaatcata gaatttcttc cgcttcctcg ctcactgact 7380
cgctgcgctc ggtcgttcgg ctgcggcgag cggtatcagc tcactcaaag gcggtaatac 7440
ggttatccac agaatcaggg gataacgcag gaaagaacat gtgagcaaaa ggccagcaaa 7500
aggccaggaa ccgtaaaaag gccgcgttgc tggcgttttt ccataggctc cgccccctg 7560
acgagcatca caaaaatcga cgctcaagtc agaggtggcg aaacccgaca ggactataaa 7620

gataccaggc gtttcccccc ggaagctccc tcgtgcgctc tcctgttccg accctgccgc 7680
ttaccggata cctgtccgcc tttctccctt cgggaagcgt ggcgctttct caatgctcac 7740
gctgtaggta tctcagttcg gtgtaggtcg ttcgctccaa gctgggctgt gtgcacgaac 7800
ccccgttca gcccgaccgc tgcgccttat ccggtaacta tcgtcttgag tccaacccgg 7860
taagacacga cttatcgcca ctggcagcag ccactggtaa caggattagc agagcgaggt 7920
atgtaggcgg tgctacagag ttcttgaagt ggtggcctaa ctacggctac actagaagga 7980
cagtatttgg tatctgcgct ctgctgaagc cagttacctt cggaaaaaga gttggtagct 8040
cttgatccgg caaacaaacc accgctggta gcggtggtgt ttgcaagcag cagattacgc 8100
gcagaaaaaa aggatctcaa gaagatcctt tgatcttttc tacggggtct gacgctcagt 8160
ggaacgaaaa ctcacgttaa gggattttgg tcatgagatt atcaaaaagg atcttcacct 8220
agatcctttt aaattaaaaa tgaagtttta aatcaatcta aagtatatat gagtaaactt 8280
ggtctgacag ttaccaatgc ttaatcagtg aggcacctat ctcagcgatc tgtctatttc 8340
gttcatccat agttgcctga ctccgggggg gggggcgct gaggtctgcc tcgtgaagaa 8400
ggtgttgctg actcatacca ggcctgaatc gccccatcat ccagccagaa agtgagggag 8460
ccacggttga tgagagcttt gttgtaggtg gaccagttgg tgattttgaa cttttgcttt 8520
gccacggaac ggtctgcgtt gtcgggaaga tgcgtgatct gatccttcaa ctcagcaaaa 8580
gttcgattta ttcaacaaag ccgccgtccc gtcaagtcag cgtaatgctc tgccagtgtt 8640
acaaccaatt aaccaattct gattagaaaa actcatcgag catcaaatga aactgcaatt 8700
tattcatatc aggattatca ataccatatt tttgaaaaag ccgtttctgt aatgaaggag 8760
aaaactcacc gaggcagttc cataggatgg caagatcctg gtatcggtct gcgattccga 8820
ctcgtccaac atcaatacaa cctattaatt tcccctcgtc aaaaataagg ttatcaagtg 8880
agaaatcacc atgagtgacg actgaatccg gtgagaatgg caaaagctta tgcatttctt 8940
tccagacttg ttcaacaggc cagccattac gctcgtcatc aaaatcactc gcatcaacca 9000
aaccgttatt cattcgtgat tgcgcctgag cgagacgaaa tacgcgatcg ctgttaaaag 9060
gacaattaca aacaggaatc gaatgcaacc ggcgcaggaa cactgccagc gcatcaacaa 9120
tattttcacc tgaatcagga tattcttcta atacctggaa tgctgttttc ccggggatcg 9180
cagtggtgag taaccatgca tcatcaggag tacggataaa atgcttgatg gtcggaagag 9240
gcataaattc cgtcagccag tttagtctga ccatctcatc tgtaacatca ttggcaacgc 9300
tacctttgcc atgtttcaga aacaactctg gcgcatcggg cttcccatac aatcgataga 9360
ttgtcgcacc tgattgcccg acattatcgc gagcccattt atacccatat aaatcagcat 9420
ccatgttgga atttaatcgc ggcctcgagc aagacgtttc ccgttgaata tggctcataa 9480
caccccttgt attactgttt atgtaagcag acagttttat tgttcatgat gatatatttt 9540
tatcttgtgc aatgtaacat cagagatttt gagacacaac gtggctttcc ccccccccc 9600
attattgaag catttatcag ggttattgtc tcatgagcgg atacatattt gaatgtattt 9660
agaaaaataa acaaataggg gttccgcgca catttccccg aaaagtgcca cctgacgtct 9720
aagaaaccat tattatcatg acattaacct ataaaaatag gcgtatcacg aggccctttc 9780
gtc 9783

<210> 173
<211> 9782
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 173
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360

ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgcttt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatatata acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tggcaaagtg gagcaagagc agcgtgatcg gctggcccgc 1920
cgtgcgcgag cgcatgcgcc gcgccgagcc cgccgccgac ggcgtgggcg ccgtgagccg 1980
cgacctggag aagcacggcg ccatcaccag cagcaacacc gccgccaaca acgccgcctg 2040
cgcctggctg gaggcccagg aggaggagga ggtgggcttc cccgtgaccc cccaggtgcc 2100
cctgcgcccc atgacctaca aggccgccgt ggacctgagc cacttcctga aggagaaggg 2160
cggcctggag ggcctgatcc acagccagcg ccgccaggac atcctggacc tgtggatcta 2220
ccacacccag ggctacttcc ccgactggca gaactacacc cccggccccg gcgtgcgcta 2280
ccccctgacc ttcggctggt gctacaagct ggtgcccgtg gagcccgaca aggtggagga 2340
ggccaacaag ggcgagaaca ccagcctgct gcaccccgtg agcctgcacg gcatggacga 2400
ccccgagcgc gaggtgctgg agtggcgctt cgacagccgc ctggccttcc accacgtggc 2460
ccgcgagctg caccccgagt acttcaagaa ctgcatggcc cgcgccagcg tgctgagcgg 2520
cggcgagctg gaccgctggg agaagatccg cctgcgcccc ggcggcaaga agaagtacaa 2580
gctgaagcac atcgtgtggg ccagccgcga gctggagcgc ttcgccgtga accccggcct 2640
gctggagacc agcgagggct gccgccagat cctgggccag ctgcagccca gcctgcagac 2700
cggcagcgag gagctgcgca gcctgtacaa caccgtggcc accctgtact gcgtgcacca 2760
gcgcatcgag atcaaggaca ccaaggaggc cctggacaag atcgaggagg agcagaacaa 2820
gagcaagaag aaggcccagc aggccgccgc cgacaccggc cacagcaacc aggtgagcca 2880
gaactacccc atcgtgcaga acatccaggg ccagatggtg caccaggcca tcagcccccg 2940
caccctgaac gcctgggtga aggtggtgga ggagaaggcc ttcagccccg aggtgatccc 3000
catgttcagc gccctgagcg agggcgccac cccccaggac ctgaacacca tgctgaacac 3060
cgtgggcggc caccaggccg ccatgcagat gctgaaggag accatcaacg aggaggccgc 3120
cgagtgggac cgcgtgcacc ccgtgcacgc cggccccatc gcccccggcc agatgcgcga 3180
gccccgcggc agcgacatcg ccggcaccac cagcaccctg caggagcaga tcggctggat 3240
gaccaacaac ccccccatcc ccgtgggcga gatctacaag cgctggatca tcctgggcct 3300
gaacaagatc gtgcgcatgt acagccccac cagcatcctg gacatccgcc agggccccaa 3360
ggagcccttc cgcgactacg tggaccgctt ctacaagacc ctgcgcgccg agcaggccag 3420
ccaggaggtg aagaactgga tgaccgagac cctgctggtg cagaacgcca accccgactg 3480
caagaccatc ctgaaggccc tgggcccccgc cgccaccctg gaggagatga tgaccgcctg 3540
ccagggcgtg ggcggccccg gccacaaggc ccgcgtgctg gccgaggcca tgagccaggt 3600
gaccaacagc gccaccatca tgatgcagcg cggcaacttc cgcaaccagc gcaagatcgt 3660

gaagtgcttc aactgcggca aggagggcca caccgcccgc aactgccgcg ccccccgcaa 3720
gaagggctgc tggaagtgcg gcaaggaggg ccaccagatg aaggactgca ccgagcgaca 3780
ggctaatagg gaagatctgg ccttcccaca agggaaggcc agggaatttt cttcagagca 3840
gaccagagcc aacagcccca ccagaagaga gcttcaggtt tggggaagag acaacaactc 3900
cctctcagaa gcaggagccg atagacaagg aactgtatcc tttagcttcc ctcagatcac 3960
tctttggcag cgacccctcg tcacaataaa gataggggggc cagctgaagg aggcccttct 4020
agacaccggc gccgacgaca ccgtgctgga ggagatgaac ctgcccggcc gctggaagcc 4080
caagatgatc ggcggcatcg gcggcttcat caaggtgggc cagtacgacc agatcctgat 4140
cgagatctgc ggccacaagg ccatcggcac cgtgctggtg ggccccaccc ccgtgaacat 4200
catcggccgc aacctgctga cccagatcgg ctgcaccctg aacttcccca tcagccccat 4260
cgagaccgtg cccgtgaagc tgaagcccgg catggacggc cccaaggtga agcagtggcc 4320
cctgaccgag gagaagatca aggccctggt ggagatctgc accgagatgg agaaggaggg 4380
caagatcagc aagatcggcc ccgagaaccc ctacaacacc cccgtgttcg ccatcaagaa 4440
gaaggacagc accaagtggc gcaagctggt ggacttccgc gagctgaaca agcgcaccca 4500
ggacttctgg gaggtgcagc tgggcatccc ccaccccgcc ggcctgaagc agaagaagag 4560
cgtgaccgtg ctggacgtgg gcgacgccta cttcagcgtg cccctggaca aggacttccg 4620
caagtacacc gccttcacca tccccagcat caacaacgag acccccggca tccgctacca 4680
gtacaacgtg ctgccccagg gctggaaggg cagccccgcc atcttccagt gcagcatgac 4740
caagatcctg gagcccttcc gcaagcagaa ccccgacatc gtgatctacc agtacatgga 4800
ccacctgtac gtgggcagcg acctggagat cggccagcac cgcaccaaga tcgaggagct 4860
gcgccagcac ctgctgcgct ggggcttcac cacccccgac aagaagcacc agaaggagcc 4920
ccccttcctg tggatgggct acgagctgca ccccgacaag tggaccgtgc agcccatcgt 4980
gctgcccgag aaggacagct ggaccgtgaa cgacatccag aagctggtgg gcaagctgaa 5040
ctgggccagc cagatctacg ccggcatcaa ggtgcgccag ctgtgcaagc tgctgcgcgg 5100
caccaaggcc ctgaccgagg tggtgcccct gaccgaggag gccgagctgg agctggccga 5160
gaaccgcgag atcctgaagg agcccgtgca cggcgtgtac tacgacccca gcaaggacct 5220
gatcgccgag atccagaagc agggccaggg ccagtggacc taccagatct accaggagcc 5280
cttcaagaac ctgaagaccg gcaagtacgc ccgcatgaag ggcgcccaca ccaacgacgt 5340
gaagcagctg accgaggccg tgcagaagat cgccaccgag agcatcgtga tctggggcaa 5400
gaccccaag ttcaagctgc ccatccagaa ggagacctgg gaggcctggt ggaccgagta 5460
ctggcaggcc acctggatcc ccgagtggga gttcgtgaac accccccccc tggtgaagct 5520
gtggtaccag ctggagaagg agcccatcat cggcgccgag accttctacg tggacggcgc 5580
cgccaaccgc gagaccaagc tgggcaaggc cggctacgtg accgaccgcg gccgccagaa 5640
ggtggtgccc ctgaccgaca ccaccaacca gaagaccgag ctgcaggcca tccacctggc 5700
cctgcaggac agcggcctgg aggtgaacat cgtgaccgac agccagtacg ccctgggcat 5760
catccaggcc cagcccgaca agagcgagag cgagctggtg agccagatca tcgagcagct 5820
gatcaagaag gagaaggtgt acctggcctg ggtgcccgcc cacaagggca tcggcggcaa 5880
cgagcaggtg gacggcctgg tgagcgccgg catccgcaag gtgctgttcc tggacggcat 5940
cgacaaggcc caggaggagc acgagaagta ccacagcaac tggcgcgcca tggccagcga 6000
cttcaacctg cccccgtgg tggccaagga gatcgtggcc agctgcgaca agtgccagct 6060
gaagggcgag gccatgcacg gccaggtgga ctgcagcccc ggcatctggc agctggcatg 6120
cacccacctg gagggcaagg tgatcctggt ggccgtgcac gtggccagcg gctacatcga 6180
ggccgaggtg atccccgccg agaccggcca ggagaccgcc tacttcctgc tgaagctggc 6240
cggccgctgg cccgtgaaga ccgtgcacac cgacaacggc agcaacttca ccagcaccac 6300
cgtgaaggcc gcctgctggt gggccggcat caagcaggag ttcggcatcc cctacaaccc 6360
ccagagccag ggcgtgatcg agagcatgaa caaggagctg aagaagatca tcggccaggt 6420
gcgcgaccag gccgagcacc tgaagaccgc cgtgcagatg gccgtgttca tccacaactt 6480
caagcgcaag ggcggcatcg gcggctacag cgccggcgag cgcatcgtgg acatcatcgc 6540
caccgacatc cagaccaagg agctgcagaa gcagatcacc aagatccaga acttccgcgt 6600
gtactaccgc gacagccgcg accccgtgtg gaagggcccc gccaagctgc tgtggaaggg 6660
cgagggcgcc gtggtgatcc aggacaacag cgacatcaag gtggtgcccc gccgcaaggc 6720
caagatcatc cgcgactacg gcaagcagat ggccggcgac gactgcgtgg ccagccgcca 6780
ggacgaggac taggaattct tgctgtgcct tctagttgcc agccatctgt tgtttgcccc 6840
tcccccgtgc cttccttgac cctggaaggt gccactccca ctgtcctttc ctaataaaat 6900
gaggaaattg catcgcattg tctgagtagg tgtcattcta ttctgggggg tggggtgggg 6960

cagcacagca aggggagga ttgggaagac aatagcaggc atgctgggga tgcggtgggc 7020
tctatgggta cccaggtgct gaagaattga cccggttcct cctgggccag aaagaagcag 7080
gcacatcccc ttctctgtga cacaccctgt ccacgcccct ggttcttagt tccagcccca 7140
ctcataggac actcatagct caggagggct ccgccttcaa tcccacccgc taaagtactt 7200
ggagcggtct ctccctccct catcagccca ccaaaccaaa cctagcctcc aagagtggga 7260
agaaattaaa gcaagatagg ctattaagtg cagagggaga gaaaatgcct ccaacatgtg 7320
aggaagtaat gagagaaatc atagaatttc ttccgcttcc tcgctcactg actcgctgcg 7380
ctcggtcgtt cggctgcggc gagcggtatc agctcactca aaggcggtaa tacggttatc 7440
cacagaatca ggggataacg caggaaagaa catgtgagca aaaggccagc aaaaggccag 7500
gaaccgtaaa aaggccgcgt tgctggcgtt tttccatagg ctccgccccc ctgacgagca 7560
tcacaaaaat cgacgctcaa gtcagaggtg gcgaaacccg acaggactat aaagatacca 7620
ggcgtttccc cctggaagct ccctcgtgcg ctctcctgtt ccgaccctgc cgcttaccgg 7680
atacctgtcc gcctttctcc cttcgggaag cgtggcgctt tctcaatgct cacgctgtag 7740
gtatctcagt tcggtgtagg tcgttcgctc caagctgggc tgtgtgcacg aacccccccgt 7800
tcagcccgac cgctgcgcct tatccggtaa ctatcgtctt gagtccaacc cggtaagaca 7860
cgacttatcg ccactggcag cagccactgg taacaggatt agcagagcga ggtatgtagg 7920
cggtgctaca gagttcttga agtggtggcc taactacggc tacactagaa ggacagtatt 7980
tggtatctgc gctctgctga agccagttac cttcggaaaa agagttggta gctcttgatc 8040
cggcaaacaa accaccgctg gtagcggtgg ttttttgtt tgcaagcagc agattacgcg 8100
cagaaaaaaa ggatctcaag aagatccttt gatcttttct acggggtctg acgctcagtg 8160
gaacgaaaac tcacgttaag ggattttggt catgagatta tcaaaaagga tcttcaccta 8220
gatcctttta aattaaaaat gaagttttaa atcaatctaa agtatatatg agtaaacttg 8280
gtctgacagt taccaatgct taatcagtga ggcacctatc tcagcgatct gtctatttcg 8340
ttcatccata gttgcctgac tccgggggggg gggggcgctg aggtctgcct cgtgaagaag 8400
gtgttgctga ctcataccag gcctgaatcg ccccatcatc cagccagaaa gtgagggagc 8460
cacggttgat gagagctttg ttgtaggtgg accagttggt gattttgaac ttttgctttg 8520
ccacggaacg gtctgcgttg tcgggaagat gcgtgatctg atccttcaac tcagcaaaag 8580
ttcgatttat tcaacaaagc cgccgtcccg tcaagtcagc gtaatgctct gccagtgtta 8640
caaccaatta accaattctg attagaaaaa ctcatcgagc atcaaatgaa actgcaattt 8700
attcatatca ggattatcaa taccatattt ttgaaaaagc cgtttctgta atgaaggaga 8760
aaactcaccg aggcagttcc ataggatggc aagatcctgg tatcggtctg cgattccgac 8820
tcgtccaaca tcaatacaac ctattaattt cccctcgtca aaaataaggt tatcaagtga 8880
gaaatcacca tgagtgacga ctgaatccgg tgagaatggc aaaagcttat gcatttcttt 8940
ccagacttgt tcaacaggcc agccattacg ctcgtcatca aaatcactcg catcaaccaa 9000
accgttattc attcgtgatt gcgcctgagc gagacgaaat acgcgatcgc tgttaaaagg 9060
acaattacaa acaggaatcg aatgcaaccg gcgcaggaac actgccagcg catcaacaat 9120
attttcacct gaatcaggat attcttctaa tacctggaat gctgttttcc cggggatcgc 9180
agtggtgagt aaccatgcat catcaggagt acggataaaa tgcttgatgg tcggaagagg 9240
cataaattcc gtcagccagt ttagtctgac catctcatct gtaacatcat tggcaacgct 9300
acctttgcca tgtttcagaa acaactctgg cgcatcgggc ttcccatata atcgatagat 9360
tgtcgcacct gattgcccga cattatcgcg agcccattta tacccatata aatcagcatc 9420
catgttggaa tttaatcgcg gcctcgagca agacgtttcc cgttgaatat ggctcataac 9480
acccttgta ttactgttta tgtaagcaga cagttttatt gttcatgatg atatattttt 9540
atcttgtgca atgtaacatc agagattttg agacacaacg tggctttccc ccccccccca 9600
ttattgaagc atttatcagg gttattgtct catgagcgga tacatatttg aatgtattta 9660
gaaaaataaa caaatagggg ttccgcgcac atttccccga aaagtgccac ctgacgtcta 9720
agaaaccatt attatcatga cattaaccta taaaaatagg cgtatcacga ggccctttcg 9780
tc 9782

<210> 174
<211> 9788
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 174
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcatc ctgcgcggcg gcaagctgga 1920
cgcctgggag cgcatcaagc tgaagcccgg cggcaagaag cactacatga tgaagcacct 1980
ggtgtgggcc agccgcgagc tggagcgctt cgccctggac cccggcctgc tggagaccag 2040
cgagggctgc aagcagatca tgaagcagct gcagcccgcc ctgcagaccg gcaccaagga 2100
gctgatcagc ctgcacaaca ccgtggccac cctgtactgc gtgcacgaga agatcgacgt 2160
gcgcgacacc aaggaggccc tggacaagat caaggaggag cagaacaaga gccagcagaa 2220
gacccagcag gccgaggccg ccgacaaggg caaggtgagc cagaactacc ccatcgtgca 2280
gaacctgcag ggccagatgg tgcaccagcc catcagcgcc cgcaccctga acgcctgggt 2340
gaaggtggtg gaggagaagg ccttcagccc cgaggtgatc cccatgttca ccgccctgag 2400
cgagggcgcc acccccccagg acctgaacac catgctgaac accgtgggcg gccaccaggc 2460
cgccatgcag atgctgaagg acaccatcaa cgaggaggcc gccgagtggg accgcctgca 2520
ccccgtgcac gccggccccg tggcccccgg ccagatgcgc gagccccgcg gcagcgacat 2580
cgccggcacc accagcaccc tgcaggagca gatcacctgg atgaccaaca acccccccgt 2640
gcccgtgggc gacatctaca agcgctggat catcctgggc ctgaacaaga tcgtgcgcat 2700
gtacagcccc gtgagcatcc tggacatcaa gcagggcccc aaggagccct tccgcgacta 2760
cgtggaccgc ttcttcaaga ccctgcgcgc cgagcaggcc acccaggacg tgaagaactg 2820
gatgaccgac accctgctgg tgcagaacgc caaccccgac tgcaagacca tcctgcgcgc 2880
cctgggcccc ggcgccagcc tggaggagat gatgaccgcc tgccagggcg tgggcggccc 2940
cggccacaag gcccgcgtgc tggccgaggc catgagcaag gtgaacaaca ccaacatcat 3000

gatgcagcgc agcaactgca agggccccaa gcgcaccatc aagtgcttca actgcggcaa 3060
ggagggccac ctggcccgca actgccgcgc cccccgcaag aagggctgct ggaagtgcgg 3120
caaggagggc caccaggtga aggactgcac cgagcgacag gctaataggg aagatctggc 3180
cttcccacaa gggaaggcca gggaattttc ttcagagcag accagagcca acagccccac 3240
cagaagagag cttcaggttt ggggaagaga caacaactcc ctctcagaag caggagccga 3300
tagacaagga actgtatcct ttagcttccc tcagatcact ctttggcagc gacccctcgt 3360
cacaataaag atagggggcc agctgaagga ggcccttcta gacaccggcg ccgacgacac 3420
cgtgctggag gagatgaacc tgcccggccg ctggaagccc aagatgatcg gcggcatcgg 3480
cggcttcatc aaggtgggcc agtacgacca gatcctgatc gagatctgcg gccacaaggc 3540
catcggcacc gtgctggtgg gccccacccc cgtgaacatc atcggccgca acctgctgac 3600
ccagatcggc tgcaccctga acttccccat cagccccatc gagaccgtgc ccgtgaagct 3660
gaagcccggc atggacggcc ccaaggtgaa gcagtggccc ctgaccgagg agaagatcaa 3720
ggccctggtg gagatctgca ccgagatgga gaaggagggc aagatcagca agatcggccc 3780
cgagaacccc tacaacaccc ccgtgttcgc catcaagaag aaggacagca ccaagtggcg 3840
caagctggtg gacttccgcg agctgaacaa gcgcacccag gacttctggg aggtgcagct 3900
gggcatcccc caccccgccg gcctgaagca gaagaagagc gtgaccgtgc tggacgtggg 3960
cgacgcctac ttcagcgtgc ccctggacaa ggacttccgc aagtacaccg ccttcaccat 4020
ccccagcatc aacaacgaga ccccccggcat ccgctaccag tacaacgtgc tgccccaggg 4080
ctggaagggc agccccgcca tcttccagtg cagcatgacc aagatcctgg agcccttccg 4140
caagcagaac cccgacatcg tgatctacca gtacatggac cacctgtacg tgggcagcga 4200
cctggagatc ggccagcacc gcaccaagat cgaggagctg cgccagcacc tgctgcgctg 4260
gggcttcacc acccccgaca agaagcacca gaaggagccc cccttcctgt ggatgggcta 4320
cgagctgcac cccgacaagt ggaccgtgca gcccatcgtg ctgcccgaga aggacagctg 4380
gaccgtgaac gacatccaga agctggtggg caagctgaac tgggccagcc agatctacgc 4440
cggcatcaag gtgcgccagc tgtgcaagct gctgcgcggc accaaggccc tgaccgaggt 4500
ggtgcccctg accgaggagg ccgagctgga gctggccgag aaccgcgaga tcctgaagga 4560
gcccgtgcac ggcgtgtact acgaccccag caaggacctg atcgccgaga tccagaagca 4620
gggccagggc cagtggacct accagatcta ccaggagccc ttcaagaacc tgaagaccgg 4680
caagtacgcc cgcatgaagg gcgcccacac caacgacgtg aagcagctga ccgaggccgt 4740
gcagaagatc gccaccgaga tcatcgtgat ctggggcaag acccccaagt tcaagctgcc 4800
catccagaag gagacctggg aggcctggtg gaccgagtac tggcaggcca cctggatccc 4860
cgagtgggag ttcgtgaaca cccccccccc ggtgaagctg tggtaccagc tggagaagga 4920
gcccatcatc ggcgccgaga ccttctacgt ggacggcgcc gccaaccgcg agaccaagct 4980
gggcaaggcc ggctacgtga ccgaccgcgg ccgccagaag gtggtgcccc tgaccgacac 5040
caccaaccag aagaccgagc tgcaggccat ccacctggcc ctgcaggaca gcggcctgga 5100
ggtgaacatc gtgaccgaca gccagtacgc cctgggcatc atccaggccc agcccgacaa 5160
gagcgagagc gagctggtga gccagatcat cgagcagctg atcaagaagg agaaggtgta 5220
cctggcctgg gtgcccgccc acaagggcat cggcggcaac gagcaggtgg acggcctggt 5280
gagcgccggc atccgcaagg tgctgttcct ggacggcatc gacaaggccc aggaggagca 5340
cgagaagtac cacagcaact ggcgcgccat ggccagcgac ttcaacctgc cccccgtggt 5400
ggccaaggag atcgtggcca gctgcgacaa gtgccagctg aagggcgagg ccatgcacgg 5460
ccaggtggac tgcagccccg gcatctggca gctggcatgc acccacctgg agggcaaggt 5520
gatcctggtg gccgtgcacg tggccagcgg ctacatcgag gccgaggtga tccccgccga 5580
gaccggccag gagaccgcct acttcctgct gaagctggcc ggccgctggc ccgtaaagac 5640
cgtgcacacc gacaacggca gcaacttcac cagcaccacc gtgaaggccg cctgctggtg 5700
ggccggcatc aagcaggagt tcggcatccc ctacaacccc cagagccagg gcgtgatcga 5760
gagcatgaac aaggagctga agaagatcat cggccaggtg cgcgaccagg ccgagcacct 5820
gaagaccgcc gtgcagatgg ccgtgttcat ccacaacttc aagcgcaagg gcggcatcgg 5880
cggctacagc gccggcgagc gcatcgtgga catcatcgcc accgacatcc agaccaagga 5940
gctgcagaag cagatcacca agatccagaa cttccgcgtg tactaccgcg acagccgcga 6000
ccccgtgtgg aagggccccg ccaagctgct gtggaagggc gagggcgccg tggtgatcca 6060
ggacaacagc gacatcaagg tggtgccccg ccgcaaggcc aagatcatcc gcgactacgg 6120
caagcagatg gccggcgacg actgcgtggc cagccgccag gacgaggaca tgggtaataa 6180
atggagcaag tgtagcactg tgggccgccc tgccatcagg gagagaatgc gccgcgcccc 6240
cgcagccgaa ggagtgggtc cagcttcaca ggatagtgac aaatacggcg ctctgacatc 6300

cagcagtacc cccgctaaca acgccgactg tgcatggctc gaagcccagc aggaagaaga 6360
ggaggtcgga ttccctgtga ggcctcaggt tcctctcaga cctatgactt acaaggccgt 6420
ggtcgacttg tctttttcc ttgaagagaa gggaggcttg gaggggctga tttacagcaa 6480
gaagcgccag gatattttgg atttgtgggt ctacaacaca cagggttact tccccgattg 6540
gcagaactac acccccggcc caggcgtgcg gtttcctctt acctttggtt ggtgctttaa 6600
gctcgtgcct gtcgatccta gagaagtgga ggaagcaaac acaggcgaga acaacagtct 6660
gctgcatcct atgagccttc atggcatgga ggattctcat cgggaagtgc ttcagtggaa 6720
attcgatagc ttgctcgcta gaagacacat ggctcgggag ttgcatcctg agtattataa 6780
ggattgttga acacgtggcg aattcttgct gtgccttcta gttgccagcc atctgttgtt 6840
tgcccctccc ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt cctttcctaa 6900
taaaatgagg aaattgcatc gcattgtctg agtaggtgtc attctattct gggggggtggg 6960
gtggggcagc acagcaaggg ggaggattgg gaagacaata gcaggcatgc tggggatgcg 7020
gtgggctcta tgggtaccca ggtgctgaag aattgacccg gttcctcctg ggccagaaag 7080
aagcaggcac atcccccttct ctgtgacaca ccctgtccac gcccctggtt cttagttcca 7140
gccccactca taggacactc atagctcagg agggctccgc cttcaatccc acccgctaaa 7200
gtacttggag cggtctctcc ctccctcatc agcccaccaa accaaaccta gcctccaaga 7260
gtgggaagaa attaaagcaa gataggctat taagtgcaga gggagagaaa atgcctccaa 7320
catgtgagga agtaatgaga gaaatcatag aatttcttcc gcttcctcgc tcactgactc 7380
gctgcgctcg gtcgttcggc tgcggcgagc ggtatcagct cactcaaagg cggtaatacg 7440
gttatccaca gaatcagggg ataacgcagg aaagaacatg tgagcaaaag gccagcaaaa 7500
ggccaggaac cgtaaaaagg ccgcgttgct ggcgtttttc cataggctcc gccccctga 7560
cgagcatcac aaaaatcgac gctcaagtca gaggtggcga aacccgacag gactataaag 7620
ataccaggcg tttccccctg gaagctccct cgtgcgctct cctgttccga ccctgccgct 7680
taccggatac ctgtccgcct ttctcccttc gggaagcgtg gcgctttctc aatgctcacg 7740
ctgtaggtat ctcagttcgg tgtaggtcgt tcgctccaag ctgggctgtg tgcacgaacc 7800
ccccgttcag cccgaccgct gcgccttatc cggtaactat cgtcttgagt ccaacccggt 7860
aagacacgac ttatcgccac tggcagcagc cactggtaac aggattagca gagcgaggta 7920
tgtaggcggt gctacagagt tcttgaagtg gtggcctaac tacggctaca ctagaaggac 7980
agtatttggt atctgcgctc tgctgaagcc agttaccttc ggaaaaagag ttggtagctc 8040
ttgatccggc aaacaaacca ccgctggtag cggtggtttt tttgtttgca agcagcagat 8100
tacgcgcaga aaaaaaggat ctcaagaaga tcctttgatc ttttctacgg ggtctgacgc 8160
tcagtggaac gaaaactcac gttaagggat tttggtcatg agattatcaa aaaggatctt 8220
cacctagatc cttttaaatt aaaaatgaag ttttaaatca atctaaagta tatatgagta 8280
aacttggtct gacagttacc aatgcttaat cagtgaggca cctatctcag cgatctgtct 8340
atttcgttca tccatagttg cctgactccg gggggggggg gcgctgaggt ctgcctcgtg 8400
aagaaggtgt tgctgactca taccaggcct gaatcgcccc atcatccagc cagaaagtga 8460
gggagccacg gttgatgaga gctttgttgt aggtggacca gttggtgatt ttgaactttt 8520
gctttgccac ggaacggtct gcgttgtcgg gaagatgcgt gatctgatcc ttcaactcag 8580
caaaagttcg atttattcaa caaagccgcc gtcccgtcaa gtcagcgtaa tgctctgcca 8640
gtgttacaac caattaacca attctgatta gaaaaactca tcgagcatca aatgaaactg 8700
caatttattc atatcaggat tatcaatacc atatttttga aaaagccgtt tctgtaatga 8760
aggagaaaac tcaccgaggc agttccatag gatggcaaga tcctggtatc ggtctgcgat 8820
tccgactcgt ccaacatcaa tacaacctat taatttcccc tcgtcaaaaa taaggttatc 8880
aagtgagaaa tcaccatgag tgacgactga atccggtgag aatggcaaaa gcttatgcat 8940
ttctttccag acttgttcaa caggccagcc attacgctcg tcatcaaaat cactcgcatc 9000
aaccaaaccg ttattcattc gtgattgcgc ctgagcgaga cgaaatacgc gatcgctgtt 9060
aaaaggacaa ttacaaacag gaatcgaatg caaccggcgc aggaacactg ccagcgcatc 9120
aacaatattt tcacctgaat caggatattc ttctaatacc tggaatgctg ttttcccggg 9180
gatcgcagtg gtgagtaacc atgcatcatc aggagtacgg ataaaatgct tgatggtcgg 9240
aagaggcata aattccgtca gccagtttag tctgaccatc tcatctgtaa catcattggc 9300
aacgctacct ttgccatgtt tcagaaacaa ctctggcgca tcgggcttcc catacaatcg 9360
atagattgtc gcacctgatt gcccgacatt atcgcgagcc catttatacc catataaatc 9420
agcatccatg ttggaattta atcgcggcct cgagcaagac gtttcccgtt gaatatggct 9480
cataacaccc cttgtattac tgtttatgta agcagacagt tttattgttc atgatgatat 9540
atttttatct tgtgcaatgt aacatcagag attttgagac acaacgtggc tttccccccc 9600

ccccccattat tgaagcattt atcagggtta ttgtctcatg agcggataca tatttgaatg 9660
tatttagaaa aataaaacaaa taggggttcc gcgcacattt ccccgaaaag tgccacctga 9720
cgtctaagaa accattatta tcatgacatt aacctataaa aataggcgta tcacgaggcc 9780
ctttcgtc 9788

<210> 175
<211> 9407
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 175
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccctttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac accccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tggcccgcgc cagcgtgctg agcggcggcg agctggaccg 1920
ctgggagaag atccgcctgc gccccggcgg caagaagaag tacaagctga agcacatcgt 1980
gtgggccagc cgcgagctgg agcgcttcgc cgtgaacccc ggcctgctgg agaccagcga 2040
gggctgccgc cagatcctgg gccagctgca gcccagcctg cagaccggca gcgaggagct 2100
gcgcagcctg tacaacaccg tggccaccct gtactgcgtg caccagcgca tcgagatcaa 2160
ggacaccaag gaggccctgg acaagatcga ggaggagcag aacaagagca agaagaaggc 2220
ccagcaggcc gccgccgaca ccggccacag caaccaggtg agccagaact accccatcgt 2280
gcagaacatc cagggccaga tggtgcacca ggccatcagc ccccgcaccc tgaacgcctg 2340

ggtgaaggtg gtggaggaga aggccttcag ccccgaggtg atccccatgt tcagcgccct 2400
gagcgagggc gccacccccc aggacctgaa caccatgctg aacaccgtgg gcggccacca 2460
ggccgccatg cagatgctga aggagaccat caacgaggag gccgccgagt gggaccgcgt 2520
gcaccccgtg cacgccggcc ccatcgcccc cggccagatg cgcgagcccc gcggcagcga 2580
catcgccggc accaccagca ccctgcagga gcagatcggc tggatgacca acaacccccc 2640
catccccgtg ggcgagatct acaagcgctg gatcatcctg ggcctgaaca agatcgtgcg 2700
catgtacagc cccaccagca tcctggacat ccgccagggc cccaaggagc ccttccgcga 2760
ctacgtggac cgcttctaca agaccctgcg cgccgagcag gccagccagg aggtgaagaa 2820
ctggatgacc gagaccctgc tggtgcagaa cgccaacccc gactgcaaga ccatcctgaa 2880
ggccctgggc cccgccgcca ccctggagga gatgatgacc gcctgccagg gcgtgggcgg 2940
ccccggccac aaggcccgcg tgctggccga ggccatgagc caggtgacca acagcgccac 3000
catcatgatg cagcgcggca acttccgcaa ccagcgcaag atcgtgaagt gcttcaactg 3060
cggcaaggag ggccacaccg cccgcaactg ccgcgccccc cgcaagaagg gctgctggaa 3120
gtgcggcaag gagggccacc agatgaagga ctgcaccgag cgacaggcta ataacgccgc 3180
ctgcgcctgg ctggaggccc aggaggagga ggaggtgggc ttccccgtga ccccccaggt 3240
gcccctgcgc cccatgacct acaaggccgc cgtggacctg agccacttcc tgaaggagaa 3300
gggcggcctg gagggcctga tccacagcca gcgccgccag gacatcctgg acctgtggat 3360
ctaccacacc cagggctact tccccgactg gcagaactac acccccggcc ccggcgtgcg 3420
ctacccccctg accttcggct ggtgctacaa gctggtgccc gtggagcccg acaaggtgga 3480
ggaggccaac aagggcgaga acaccagcct gctgcacccc gtgagcctgc acggcatgga 3540
cgaccccgag cgcgaggtgc tggagtggcg cttcgacagc cgcctggcct tccaccacgt 3600
ggcccgcgag ctgcaccccg agtacttcaa gaactgcgcc cttctagaca ccggcgccga 3660
cgacaccgtg ctggaggaga tgaacctgcc cggccgctgg aagcccaaga tgatcggcgg 3720
catcggcggc ttcatcaagg tgggccagta cgaccagatc ctgatcgaga tctgcggcca 3780
caaggccatc ggcaccgtgc tggtgggccc caccccctgg aacatcatcg gccgcaacct 3840
gctgacccag atcggctgca ccctgaactt ccccatcagc cccatcgaga ccgtgcccgt 3900
gaagctgaag cccggcatgg acggccccaa ggtgaagcag tggcccctga ccgaggagaa 3960
gatcaaggcc ctggtggaga tctgcaccga gatggagaag gagggcaaga tcagcaagat 4020
cggccccgag aacccctaca acaccccccgt gttcgccatc aagaagaagg acagcaccaa 4080
gtggcgcaag ctggtggact tccgcgagct gaacaagcgc acccaggact tctgggaggt 4140
gcagctgggc atcccccacc ccgccggcct gaagcagaag aagagcgtga ccgtgctgga 4200
cgtgggcgac gcctacttca gcgtgcccct ggacaaggac ttccgcaagt acaccgcctt 4260
caccatcccc agcatcaaca acgagacccc cggcatccgc taccagtaca acgtgctgcc 4320
ccagggctgg aagggcagcc ccgccatctt ccagtgcagc atgaccaaga tcctggagcc 4380
cttccgcaag cagaaccccg acatcgtgat ctaccagtac atggaccacc tgtacgtggg 4440
cagcgacctg gagatcggcc agcaccgcac caagatcgag gagctgcgcc agcacctgct 4500
gcgctggggc ttcaccaccc ccgacaagaa gcaccagaag gagccccccct tcctgtggat 4560
gggctacgag ctgcaccccg acaagtggac cgtgcagccc atcgtgctgc ccgagaagga 4620
cagctggacc gtgaacgaca tccagaagct ggtgggcaag ctgaactggg ccagccagat 4680
ctacgccggc atcaaggtgc gccagctgtg caagctgctg cgcggcacca aggccctgac 4740
cgaggtggtg cccctgaccg aggaggccga gctggagctg gccgagaacc gcgagatcct 4800
gaaggagccc gtgcacggcg tgtactacga ccccagcaag gacctgatcg ccgagatcca 4860
gaagcagggc cagggccagt ggacctacca gatctaccag gagccttca agaacctgaa 4920
gaccggcaag tacgcccgca tgaagggcgc ccacaccaac gacgtgaagc agctgaccga 4980
ggccgtgcag aagatcgcca ccgagagcat cgtgatctgg ggcaagaccc ccaagttcaa 5040
gctgcccatc cagaaggaga cctgggaggc ctggtggacc gagtactggc aggccacctg 5100
gatccccgag tgggagttcg tgaacacccc ccccctggtg aagctgtggt accagctgga 5160
gaaggagccc atcatcggcg ccgagacctt ctacgtggac ggcgccgcca accgcgagac 5220
caagctgggc aaggccggct acgtgaccga ccgcggccgc cagaaggtgg tgccctgac 5280
cgacaccacc aaccagaaga ccgagctgca ggccatccac ctggccctgc aggacagcgg 5340
cctggaggtg aacatcgtga ccgacagcca gtacgccctg ggcatcatcc aggcccagcc 5400
cgacaagagc gagagcgagc tggtgagcca gatcatcgag cagctgatca agaaggagaa 5460
ggtgtacctg gcctgggtgc ccgcccacaa gggcatcggc ggcaacgagc aggtggacgg 5520
cctggtgagc gccggcatcc gcaaggtgct gttcctggac ggcatcgaca aggcccagga 5580
ggagcacgag aagtaccaca gcaactggcg cgccatggcc agcgacttca acctgccccc 5640

cgtggtggcc aaggagatcg tggccagctg cgacaagtgc cagctgaagg gcgaggccat 5700
gcacggccag gtggactgca gccccggcat ctggcagctg gcatgcaccc acctggaggg 5760
caaggtgatc ctggtggccg tgcacgtggc cagcggctac atcgaggccg aggtgatccc 5820
cgccgagacc ggccaggaga ccgcctactt cctgctgaag ctggccggcc gctggcccgt 5880
gaagaccgtg cacaccgaca acggcagcaa cttcaccagc accaccgtga aggccgcctg 5940
ctggtgggcc ggcatcaagc aggagttcgg catcccctac aacccccaga gccagggcgt 6000
gatcgagagc atgaacaagg agctgaagaa gatcatcggc caggtgcgcg accaggccga 6060
gcacctgaag accgccgtgc agatggccgt gttcatccac aacttcaagc gcaagggcgg 6120
catcggcggc tacagcgccg gcgagcgcat cgtggacatc atcgccaccg acatccagac 6180
caaggagctg cagaagcaga tcaccaagat ccagaacttc cgcgtgtact accgcgacag 6240
ccgcgacccc gtgtggaagg gccccgccaa gctgctgtgg aagggcgagg gcgccgtggt 6300
gatccaggac aacagcgaca tcaaggtggt gccccgccgc aaggccaaga tcatccgcga 6360
ctacggcaag cagatggccg gcgacgactg cgtggccagc cgccaggacg aggactagga 6420
attcttgctg tgccttctag ttgccagcca tctgttgttt gcccctcccc cgtgccttcc 6480
ttgaccctgg aaggtgccac tcccactgtc ctttcctaat aaaatgagga aattgcatcg 6540
cattgtctga gtaggtgtca ttctattctg gggggtgggg tggggcagca cagcaagggg 6600
gaggattggg aagacaatag caggcatgct ggggatgcgg tgggctctat gggtacccag 6660
gtgctgaaga attgacccgg ttcctcctgg gccagaaaga agcaggcaca tccccttctc 6720
tgtgacacac cctgtccacg cccctggttc ttagttccag ccccactcat aggacactca 6780
tagctcagga gggctccgcc ttcaatccca cccgctaaag tacttggagc ggtctctccc 6840
tccctcatca gcccaccaaa ccaaacctag cctccaagag tgggaagaaa ttaaagcaag 6900
ataggctatt aagtgcagag ggagagaaaa tgcctccaac atgtgaggaa gtaatgagag 6960
aaatcataga atttcttccg cttcctcgct cactgactcg ctgcgctcgg tcgttcggct 7020
gcggcgagcg gtatcagctc actcaaaggc ggtaatacgg ttatccacag aatcagggga 7080
taacgcagga aagaacatgt gagcaaaagg ccagcaaaag gccaggaacc gtaaaaaggc 7140
cgcgttgctg gcgtttttcc ataggctccg cccccctgac gagcatcaca aaaatcgacg 7200
ctcaagtcag aggtggcgaa acccgacagg actataaaga taccaggcgt ttcccccctgg 7260
aagctccctc gtgcgctctc ctgttccgac cctgccgctt accggatacc tgtccgcctt 7320
tctcccttcg ggaagcgtgg cgctttctca atgctcacgc tgtaggtatc tcagttcggt 7380
gtaggtcgtt cgctccaagc tgggctgtgt gcacgaaccc cccgttcagc ccgaccgctg 7440
cgccttatcc ggtaactatc gtcttgagtc caacccggta agacacgact tatcgccact 7500
ggcagcagcc actggtaaca ggattagcag agcgaggtat gtaggcggtg ctacagagtt 7560
cttgaagtgg tggcctaact acggctacac tagaaggaca gtatttggta tctgcgctct 7620
gctgaagcca gttaccttcg gaaaaagagt tggtagctct tgatccggca aacaaaccac 7680
cgctggtagc ggtggttttt ttgtttgcaa gcagcagatt acgcgcagaa aaaaaggatc 7740
tcaagaagat cctttgatct tttctacggg gtctgacgct cagtggaacg aaaactcacg 7800
ttaagggatt ttggtcatga gattatcaaa aaggatcttc acctagatcc ttttaaatta 7860
aaaatgaagt tttaaatcaa tctaaagtat atatgagtaa acttggtctg acagttacca 7920
atgcttaatc agtgaggcac ctatctcagc gatctgtcta tttcgttcat ccatagttgc 7980
ctgactccgg gggggggggg cgctgaggtc tgcctcgtga agaaggtgtt gctgactcat 8040
accaggcctg aatcgcccca tcatccagcc agaaagtgag ggagccacgg ttgatgagag 8100
ctttgttgta ggtggaccag ttggtgattt tgaacttttg ctttgccacg gaacggtctg 8160
cgttgtcggg aagatgcgtg atctgatcct tcaactcagc aaaagttcga tttattcaac 8220
aaagccgccg tcccgtcaag tcagcgtaat gctctgccag tgttacaacc aattaaccaa 8280
ttctgattag aaaaactcat cgagcatcaa atgaaactgc aatttattca tatcaggatt 8340
atcaatacca tatttttgaa aaagccgttt ctgtaatgaa ggagaaaact caccgaggca 8400
gttccatagg atggcaagat cctggtatcg gtctgcgatt ccgactcgtc caacatcaat 8460
acaacctatt aatttccccct cgtcaaaaat aaggttatca agtgagaaat caccatgagt 8520
gacgactgaa tccggtgaga atggcaaaag cttatgcatt tctttccaga cttgttcaac 8580
aggccagcca ttacgctcgt catcaaaatc actcgcatca accaaaccgt tattcattcg 8640
tgattgcgcc tgagcgagac gaaatacgcg atcgctgtta aaaggacaat tacaaacagg 8700
aatcgaatgc aaccggcgca ggaacactgc cagcgcatca acaatatttt cacctgaatc 8760
aggatattct tctaatacct ggaatgctgt tttcccgggg atcgcagtgg tgagtaacca 8820
tgcatcatca ggagtacgga taaaatgctt gatggtcgga agaggcataa attccgtcag 8880
ccagtttagt ctgaccatct catctgtaac atcattggca acgctacctt tgccatgttt 8940

cagaaacaac tctggcgcat cgggcttccc atacaatcga tagattgtcg cacctgattg 9000
cccgacatta tcgcgagccc atttataccc atataaatca gcatccatgt tggaatttaa 9060
tcgcggcctc gagcaagacg tttcccgttg aatatggctc ataacacccc ttgtattact 9120
gtttatgtaa gcagacagtt ttattgttca tgatgatata tttttatctt gtgcaatgta 9180
acatcagaga ttttgagaca caacgtggct ttcccccccc ccccattatt gaagcattta 9240
tcagggttat tgtctcatga gcggatacat atttgaatgt atttagaaaa ataaacaaat 9300
aggggttccg cgcacatttc cccgaaaagt gccacctgac gtctaagaaa ccattattat 9360
catgacatta acctataaaa ataggcgtat cacgaggccc tttcgtc 9407

<210> 176
<211> 9785
<212> DNA
<213> Artificial Sequence

<220>
<223> plasmid pVR1012x/s containing HIV genes

<400> 176
tcgcgcgttt cggtgatgac ggtgaaaacc tctgacacat gcagctcccg gagacggtca 60
cagcttgtct gtaagcggat gccgggagca gacaagcccg tcagggcgcg tcagcgggtg 120
ttggcgggtg tcggggctgg cttaactatg cggcatcaga gcagattgta ctgagagtgc 180
accatatgcg gtgtgaaata ccgcacagat gcgtaaggag aaaataccgc atcagattgg 240
ctattggcca ttgcatacgt tgtatccata tcataatatg tacatttata ttggctcatg 300
tccaacatta ccgccatgtt gacattgatt attgactagt tattaatagt aatcaattac 360
ggggtcatta gttcatagcc catatatgga gttccgcgtt acataactta cggtaaatgg 420
cccgcctggc tgaccgccca acgacccccg cccattgacg tcaataatga cgtatgttcc 480
catagtaacg ccaataggga ctttccattg acgtcaatgg gtggagtatt tacggtaaac 540
tgcccacttg gcagtacatc aagtgtatca tatgccaagt acgcccccta ttgacgtcaa 600
tgacggtaaa tggcccgcct ggcattatgc ccagtacatg accttatggg actttcctac 660
ttggcagtac atctacgtat tagtcatcgc tattaccatg gtgatgcggt tttggcagta 720
catcaatggg cgtggatagc ggtttgactc acggggattt ccaagtctcc accccattga 780
cgtcaatggg agtttgtttt ggcaccaaaa tcaacgggac tttccaaaat gtcgtaacaa 840
ctccgcccca ttgacgcaaa tgggcggtag gcgtgtacgg tgggaggtct atataagcag 900
agctcgttta gtgaaccgtc agatcgcctg gagacgccat ccacgctgtt ttgacctcca 960
tagaagacac cgggaccgat ccagcctccg cggccgggaa cggtgcattg gaacgcggat 1020
tccccgtgcc aagagtgacg taagtaccgc ctatagactc tataggcaca ccccttggc 1080
tcttatgcat gctatactgt ttttggcttg gggcctatac acccccgctt ccttatgcta 1140
taggtgatgg tatagcttag cctataggtg tgggttattg accattattg accactcccc 1200
tattggtgac gatactttcc attactaatc cataacatgg ctctttgcca caactatctc 1260
tattggctat atgccaatac tctgtccttc agagactgac acggactctg tatttttaca 1320
ggatggggtc ccatttatta tttacaaatt cacatataca acaacgccgt cccccgtgcc 1380
cgcagttttt attaaacata gcgtgggatc tccacgcgaa tctcgggtac gtgttccgga 1440
catgggctct tctccggtag cggcggagct tccacatccg agccctggtc ccatgcctcc 1500
agcggctcat ggtcgctcgg cagctccttg ctcctaacag tggaggccag acttaggcac 1560
agcacaatgc ccaccaccac cagtgtgccg cacaaggccg tggcggtagg gtatgtgtct 1620
gaaaatgagc gtggagattg ggctcgcacg gctgacgcag atggaagact taaggcagcg 1680
gcagaagaag atgcaggcag ctgagttgtt gtattctgat aagagtcaga ggtaactccc 1740
gttgcggtgc tgttaacggt ggagggcagt gtagtctgag cagtactcgt tgctgccgcg 1800
cgcgccacca gacataatag ctgacagact aacagactgt tcctttccat gggtcttttc 1860
tgcagtcacc gtcgtcgaca tgggcgcccg cgccagcgtg ctgagcggcg gcaagttcga 1920
cgcctgggag aagatccgcc tgcgccccgg cggcaagaag aagtaccgca tgaagcacct 1980
gatctgggcc agccgcgagc tggaccgctt cgccctgaac cccagcctgc tggagaccgc 2040
cgacggctgc cagcagatca tggagaagct gcagcccgcc ctgaagaccg gcaccgagga 2100

gatcaagagc ctgttcaaca ccgtggccac cctgtactgc gtgcaccagc gcatcgacgt 2160
gaaggacacc aaggaggccc tggacaagat cgaggagatc aagaacaaga gcaagcagaa 2220
gacccagcag gccgccgccg acaccggcaa cagcagcaac gtgagccaga actaccccat 2280
cgtgcagaac gcccagggcc agatgatcca ccagagcctg agcccccgca ccctgaacgc 2340
ctgggtgaag gtgatcgagg agaaggcctt cagccccgag gtgatcccca tgttcagcgc 2400
cctgagcgag ggcgccaccc cccaggacct gaacatgatg ctgaacatcg tgggcggcca 2460
ccaggccgcc atgcagatgc tgaaggacac catcaacgag gaggccgccg agtgggaccg 2520
cctgcacccc gtgcacgccg gccccatccc ccccggccag atgcgcgagc cccgcggcag 2580
cgacatcgcc ggcaccacca gcacccccca ggagcagatc ggctggatga ccggcaaccc 2640
ccccatcccc gtgggcgaca tctacaagcg ctggatcatc ctgggcctga acaagatcgt 2700
gcgcatgtac agccccgtga gcatcctgga catcaagcag ggccccaagg agcccttccg 2760
cgactacgtg gaccgcttct tcaagacctt ccgcgccgag caggccaccc aggacgtgaa 2820
gaactggatg accgacaccc tgctggtgca gaacgccaac cccgactgca aggccatcct 2880
gcgcgccctg ggccccggcg ccaccctgga ggagatgatg accgcctgcc agggcgtggg 2940
cggccccggc cacaaggccc gcgtgctggc cgaggccatg agccaggtgc agcacaccaa 3000
catcatgatg cagcgcggca acttcaaggg ccagaagcgc atcaagtgct tcaactgcgg 3060
caaggagggc cacctggccc gcaactgccg cgccctgcgc aagaagggct gctggaagtg 3120
cggcaaggag ggccaccaga tgaaggactg caccgagcga caggctaata gggaagatct 3180
ggccttccca caagggaagg ccagggaatt ttcttcagag cagaccagag ccaacagccc 3240
caccagaaga gagcttcagg tttggggaag agacaacaac tccctctcag aagcaggagc 3300
cgatagacaa ggaactgtat cctttagctt ccctcagatc actctttggc agcgaccct 3360
cgtcacaata aagatagggg gccagctgaa ggaggccctt ctagacaccg gcgccgacga 3420
caccgtgctg gaggagatga acctgcccgg ccgctggaag cccaagatga tcggcggcat 3480
cggcggcttc atcaaggtgg gccagtacga ccagatcctg atcgagatct gcggccacaa 3540
ggccatcggc accgtgctgg tgggccccac ccccgtgaac atcatcggcc gcaacctgct 3600
gacccagatc ggctgcaccc tgaacttccc catcagcccc atcgagaccg tgcccgtgaa 3660
gctgaagccc ggcatggacg gccccaaggt gaagcagtgg cccctgaccg aggagaagat 3720
caaggccctg gtggagatct gcaccgagat ggagaaggag ggcaagatca gcaagatcgg 3780
ccccgagaac ccctacaaca ccccccgtgtt cgccatcaag aagaaggaca gcaccaagtg 3840
gcgcaagctg gtggacttcc gcgagctgaa caagcgcacc caggacttct gggaggtgca 3900
gctgggcatc ccccaccccg ccggcctgaa gcagaagaag agcgtgaccg tgctggacgt 3960
gggcgacgcc tacttcagcg tgcccctgga caaggacttc cgcaagtaca ccgccttcac 4020
catccccagc atcaacaacg agacccccgg catccgctac cagtacaacg tgctgcccca 4080
gggctggaag ggcagccccg ccatcttcca gtgcagcatg accaagatcc tggagccctt 4140
ccgcaagcag aaccccgaca tcgtgatcta ccagtacatg gaccacctgt acgtgggcag 4200
cgacctggag atcggccagc accgcaccaa gatcgaggag ctgcgccagc acctgctgcg 4260
ctggggcttc accaccccg acaagaagca ccagaaggag ccccccttcc tgtggatggg 4320
ctacgagctg caccccgaca agtggaccgt gcagcccatc gtgctgcccg agaaggacag 4380
ctggaccgtg aacgacatcc agaagctggt gggcaagctg aactgggcca gccagatcta 4440
cgccggcatc aaggtgcgcc agctgtgcaa gctgctgcgc ggcaccaagg ccctgaccga 4500
ggtggtgccc ctgaccgagg aggccgagct ggagctggcc gagaaccgcg agatcctgaa 4560
ggagcccgtg cacggcgtgt actacgaccc cagcaaggac ctgatcgccg agatccagaa 4620
gcagggccag ggccagtgga cctaccagat ctaccaggag cccttcaaga acctgaagac 4680
cggcaagtac gcccgcatga agggcgccca caccaacgac gtgaagcagc tgaccgaggc 4740
cgtgcagaag atcgccaccg agagcatcgt gatctggggc aagaccccca agttcaagct 4800
gcccatccag aaggagacct gggaggcctg gtggaccgag tactggcagg ccacctggat 4860
ccccgagtgg gagttcgtga acaccccccc cctggtgaag ctgtggtacc agctggagaa 4920
ggagcccatc atcggcgccg agaccttcta cgtggacggc gccgccaacc gcgagaccaa 4980
gctgggcaag gccggctacg tgaccgaccg cggccgccag aaggtggtgc ccctgaccga 5040
caccaccaac cagaagaccg agctgcaggc catccacctg gccctgcagg acagcggcct 5100
ggaggtgaac atcgtgaccg acagccagta cgccctgggc atcatccagg cccagcccga 5160
caagagcgag agcgagctgg tgagccagat catcgagcag ctgatcaaga aggagaaggt 5220
gtacctggcc tgggtgcccg cccacaaggg catcggcggc aacgagcagg tggacggcct 5280
ggtgagcgcc ggcatccgca aggtgctgtt cctggacggc atcgacaagg cccaggagga 5340
gcacgagaag taccacagca actggcgcgc catggccagc gacttcaacc tgccccccgt 5400

ggtggccaag gagatcgtgg ccagctgcga caagtgccag ctgaagggcg aggccatgca 5460
cggccaggtg gactgcagcc ccggcatctg gcagctggca tgcacccacc tggagggcaa 5520
ggtgatcctg gtggccgtgc acgtggccag cggctacatc gaggccgagg tgatccccgc 5580
cgagaccggc caggagaccg cctacttcct gctgaagctg gccggccgct ggcccgtgaa 5640
gaccgtgcac accgacaacg gcagcaactt caccagcacc accgtgaagg ccgcctgctg 5700
gtgggccggc atcaagcagg agttcggcat cccctacaac ccccagagcc agggcgtgat 5760
cgagagcatg aacaaggagc tgaagaagat catcggccag gtgcgcgacc aggccgagca 5820
cctgaagacc gccgtgcaga tggccgtgtt catccacaac ttcaagcgca agggcggcat 5880
cggcggctac agcgccggcg agcgcatcgt ggacatcatc gccaccgaca tccagaccaa 5940
ggagctgcag aagcagatca ccaagatcca gaacttccgc gtgtactacc gcgacagccg 6000
cgaccccgtg tggaagggcc ccgccaagct gctgtggaag ggcgagggcg ccgtggtgat 6060
ccaggacaac agcgacatca aggtggtgcc ccgccgcaag gccaagatca tccgcgacta 6120
cggcaagcag atggccggcg acgactgcgt ggccagccgc caggacgagg acatgggcag 6180
caagtggagc aagagcagca tcgtgggctg gagggaggtg agggagaggc tgaggcagac 6240
cctggccgcc gccagaggcg tgggcgccgt gagccaggac ctggagaagt acggcgccgt 6300
gaccagcagc aacgtgaacc accctagctg cgcctggctg gaggcccagg aggaggagga 6360
ggtgggcttc cctgtgaggc ctcacgtgcc tctgaggcct atgacctaca agggcgccct 6420
ggacctgagc cacttcctga aggagaaggg cggcctggac ggcctgatct acagcaggag 6480
gaggcaggag atcctggacc tgtgggtgta caacacccag ggctacttcc ctgactggca 6540
gaactacaca cccggccctg gcgtgaggta ccctctgacc ttcggctggt gcttcaagct 6600
ggtgcctgtg gaccctgacg aggtggagca ggccaacgag ggcgagaaca acagcctgct 6660
gcaccctatg tgccagcacg gcatggacga cgaggagaag gagaccctga ggtggaggtt 6720
cgacagcagg ctggccctga ggcacagggc ccaggagatg caccctgagt tctacaagga 6780
ctgctgaaca cgtggcgaat tcttgctgtg ccttctagtt gccagccatc tgttgtttgc 6840
ccctcccccg tgccttcctt gaccctggaa ggtgccactc ccactgtcct ttcctaataa 6900
aatgaggaaa ttgcatcgca ttgtctgagt aggtgtcatt ctattctggg gggtggggtg 6960
gggcagcaca gcaaggggga ggattgggaa gacaatagca ggcatgctgg ggatgcggtg 7020
ggctctatgg gtacccaggt gctgaagaat tgacccggtt cctcctgggc cagaaagaag 7080
caggcacatc cccttctctg tgacacaccc tgtccacgcc cctggttctt agttccagcc 7140
ccactcatag gacactcata gctcaggagg gctccgcctt caatcccacc cgctaaagta 7200
cttggagcgg tctctccctc cctcatcagc ccaccaaacc aaacctagcc tccaagagtg 7260
ggaagaaatt aaagcaagat aggctattaa gtgcagaggg agagaaaatg cctccaacat 7320
gtgaggaagt aatgagagaa atcatagaat ttcttccgct tcctcgctca ctgactcgct 7380
gcgctcggtc gttcggctgc ggcgagcggt atcagctcac tcaaaggcgg taatacggtt 7440
atccacagaa tcaggggata acgcaggaaa gaacatgtga gcaaaaggcc agcaaaaggc 7500
caggaaccgt aaaaaggccg cgttgctggc gtttttccat aggctccgcc cccctgacga 7560
gcatcacaaa aatcgacgct caagtcagag gtggcgaaac ccgacaggac tataaagata 7620
ccaggcgttt ccccctggaa gctccctcgt gcgctctcct gttccgaccc tgccgcttac 7680
cggatacctg tccgcctttc tcccttcggg aagcgtggcg ctttctcaat gctcacgctg 7740
taggtatctc agttcggtgt aggtcgttcg ctccaagctg ggctgtgtgc acgaaccccc 7800
cgttcagccc gaccgctgcg ccttatccgg taactatcgt cttgagtcca acccggtaag 7860
acacgactta tcgccactgg cagcagccac tggtaacagg attagcagag cgaggtatgt 7920
aggcggtgct acagagttct tgaagtggtg gcctaactac ggctacacta gaaggacagt 7980
atttggtatc tgcgctctgc tgaagccagt taccttcgga aaaagagttg gtagctcttg 8040
atccggcaaa caaaccaccg ctggtagcgg tggtttttt gtttgcaagc agcagattac 8100
gcgcagaaaa aaaggatctc aagaagatcc tttgatcttt tctacggggt ctgacgctca 8160
gtggaacgaa aactcacgtt aagggatttt ggtcatgaga ttatcaaaaa ggatcttcac 8220
ctagatcctt ttaaattaaa aatgaagttt taaatcaatc taaagtatat atgagtaaac 8280
ttggtctgac agttaccaat gcttaatcag tgaggcacct atctcagcga tctgtctatt 8340
tcgttcatcc atagttgcct gactccgggg gggggggcgc ctgaggtctg cctcgtgaag 8400
aaggtgttgc tgactcatac caggcctgaa tcgccccatc atccagccag aaagtgaggg 8460
agccacggtt gatgagagct ttgttgtagg tggaccagtt ggtgattttg aacttttgct 8520
ttgccacgga acggtctgcg ttgtcgggaa gatgcgtgat ctgatccttc aactcagcaa 8580
aagttcgatt tattcaacaa agccgccgtc ccgtcaagtc agcgtaatgc tctgccagtg 8640
ttacaaccaa ttaaccaatt ctgattagaa aaactcatcg agcatcaaat gaaactgcaa 8700

```
tttattcata tcaggattat caataccata tttttgaaaa agccgtttct gtaatgaagg 8760
agaaaactca ccgaggcagt tccataggat ggcaagatcc tggtatcggt ctgcgattcc 8820
gactcgtcca acatcaatac aacctattaa tttcccctcg tcaaaaataa ggttatcaag 8880
tgagaaatca ccatgagtga cgactgaatc cggtgagaat ggcaaaagct tatgcatttc 8940
tttccagact tgttcaacag gccagccatt acgctcgtca tcaaaatcac tcgcatcaac 9000
caaaccgtta ttcattcgtg attgcgcctg agcgagacga aatacgcgat cgctgttaaa 9060
aggacaatta caaacaggaa tcgaatgcaa ccggcgcagg aacactgcca gcgcatcaac 9120
aatattttca cctgaatcag gatattcttc taatacctgg aatgctgttt tcccggggat 9180
cgcagtggtg agtaaccatg catcatcagg agtacggata aaatgcttga tggtcggaag 9240
aggcataaat tccgtcagcc agtttagtct gaccatctca tctgtaacat cattggcaac 9300
gctacctttg ccatgtttca gaaacaactc tggcgcatcg ggcttcccat acaatcgata 9360
gattgtcgca cctgattgcc cgacattatc gcgagcccat ttatacccat ataaatcagc 9420
atccatgttg gaatttaatc gcggcctcga gcaagacgtt tcccgttgaa tatggctcat 9480
aacacccctt gtattactgt ttatgtaagc agacagtttt attgttcatg atgatatatt 9540
tttatcttgt gcaatgtaac atcagagatt ttgagacaca acgtggcttt cccccccccc 9600
ccattattga agcatttatc agggttattg tctcatgagc ggatacatat ttgaatgtat 9660
ttagaaaaat aaacaaatag gggttccgcg cacatttccc cgaaaagtgc cacctgacgt 9720
ctaagaaacc attattatca tgacattaac ctataaaaat aggcgtatca cgaggccctt 9780
tcgtc                                                           9785
```